April 2, 1941

NATIONAL PETROLEUM NEWS

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APR 3 - 1941
DETROIT

NEW CATALYTIC REFORMING PROCESS EASY TO CONVERT TO WAR NEEDS

A 7500-barrel hydroforming unit, the first commercial catalytic reforming process of its type, is converting 40-45 octane naphtha to 80-octane gasoline with an 80% yield at Texas City. A simple plant modification will enable production of 5,000,000 gallons toluene annually.

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• • •

COPPER-LEAD BEARING CORROSION SERIOUS IN HEAVY-DUTY SERVICE

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Combustion Research Needs Co-operation

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Mid-Western refiners say recent ICC rate decision will enable them to keep present volume of business. Page 11.

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Crude advances announced by many large purchasers. Page 11.

* * *

Defense Oil Advisor Wilson tells Cole Committee that immediate control of oil industry would result in "bottleneck". Page 11.

* * *

Army and Navy to increase gasoline purchases; needs rise 300 to 400%. Page 13.

TNEC (Monopoly) submits final report to Congress. Page 14.

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Oil industry reserves viewed in U. S. and Canada. Page 17.

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Canada releases permits for all lube oil imports. Page 13.

* * *

Petroleum Refiners plan April 16-18 meeting at Hot Springs, Ark. Page 18.

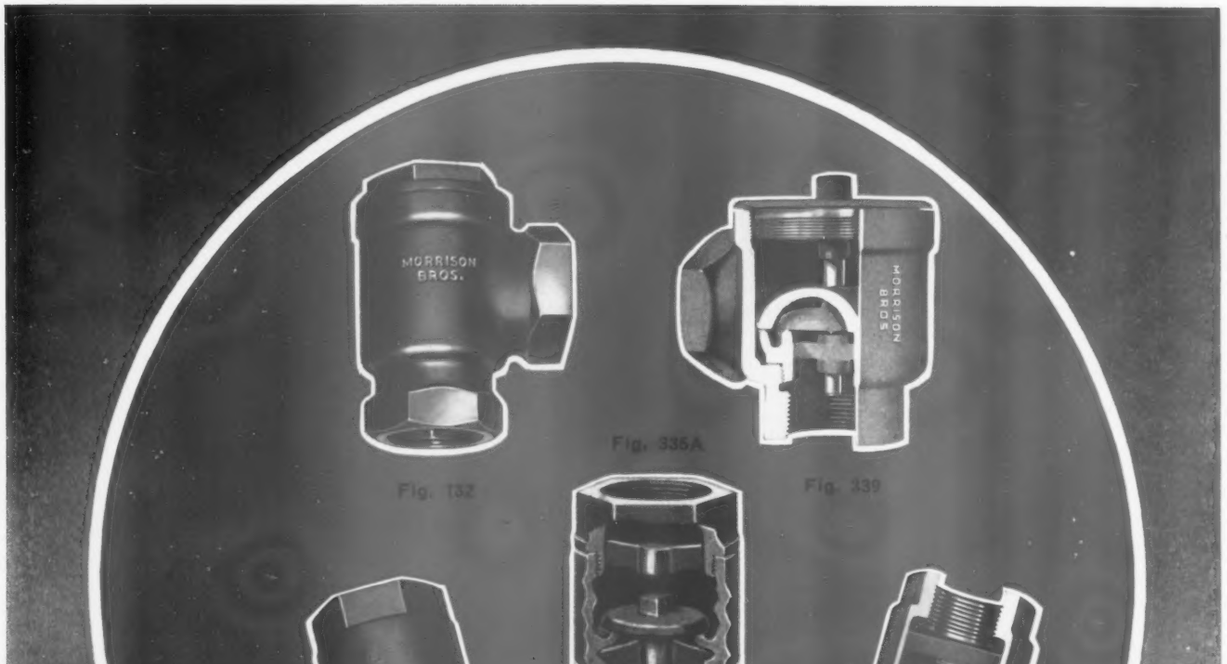
* * *

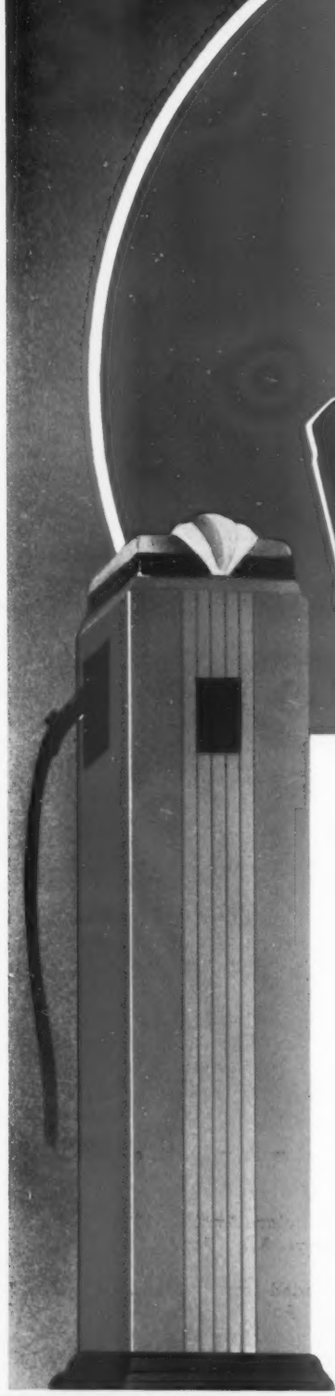
Five tankers included among Axis ships seized by U. S. Page 24.

* * *

Research projects to be discussed at Natural Gas convention. Page 19.

REFINING TECHNOLOGY EDITION





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FOR EVERY PUMP

Morrison Foot Valves Seat Quickly . . and Stay Tight. Designed and engineered to handle the newest types of gasoline and to keep your gasoline-dispensing pumps operating successfully and accurately.

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MORRISON BROS. COMPANY
OIL EQUIPMENT HEADQUARTERS
DUBUQUE, IOWA

R v.33 pt2 Apr-June 1941

NATIONAL PETROLEUM NEWS

APRIL 2, 1941

COMING MEETINGS

APRIL

American Chemical Society, St. Louis, Mo., Mon.-Fri., April 7-11.

Midwest Power Conference, Palmer House, Chicago, Wed.-Thurs., Apr. 9-10.

All Ohio Safety Congress, 12th Annual, Neil House, Columbus, O., Tues.-Thurs., Apr. 15-17.

Western Petroleum Refiners Assn., Arlington Hotel, Hot Springs, Ark., Wed.-Thurs., April 16-18.

American Petroleum Institute, Division of Production, Wm. Penn Hotel, Pittsburgh, Pa., Thurs.-Fri., April 17-18.

Greater New York Safety Council, Safety Convention & Exposition, Hotel Pennsylvania, N. Y., Tues.-Fri., April 22-25.

Petroleum Industry Electrical Assn., Tulsa, Okla., Wed.-Fri., April 23-25.

Natural Gasoline Assn. of America, Annual Convention, Baker Hotel, Dallas, Texas, Wed.-Fri., April 23-25.

Fuel Oil Distributors Assn., Asbury Park, N. J., Wed.-Fri., April 24-25.

National Petroleum Assn., semi-annual Meeting, Hotel Cleveland, Cleveland, O., Thurs.-Fri., April 24-25.

Petroleum and Natural Gas Conference, State College, Pa., Fri.-Sat., Apr. 25-26.

MAY

American Trucking Assn., Inc., 2nd Annual Spring Forum, Continental Hotel, Kansas City, Mo., Sun.-Wed., May 4-7.

American Gas Assn., Natural Gas Section, Dallas, Tex., Mon.-Thurs., May 5-8.

Independent Oil Men's Assn. of New England, Annual Convention, Copley Plaza Hotel, Boston, Mass., Thurs., May 8.

Society of Automotive Engineers, Production Meeting, Schroeder Hotel, Milwaukee, Wis., May 12 and 13.

Virginia Petroleum Jobbers Assn., Spring Meeting, John Marshall Hotel, Richmond, Va., May 15.

Virginia Oil Men's Assn., annual spring meeting, John Marshall Hotel, Richmond, Va., Fri., May 16.

American Institute of Chemical Engineers, 33rd Semi-Annual Meeting, Edgewater Beach Hotel, Chicago, Ill., Mon.-Wed., May 19-21.

American Petroleum Institute, 11th Mid-Year Meeting, Mayo Hotel, Tulsa, Okla., Mon.-Fri., May 19-22.

National Assn. of Purchasing Agents, (Oil Company Buyers' Group) Stevens Hotel, Chicago, Mon.-Thurs., May 26-29.

National Oil Scouts & Land Men's Assn., Dallas, Tex., Thurs.-Sat., May 29-31.

JUNE

Society of Automotive Engineers, Summer Meeting, The Greenbrier, White Sulphur Springs, W. Va., Sun.-Fri., June 1-6.

Illinois-Indiana Petroleum Assn., 9th Annual Petroleum Conference, Robinson, Ill., Sat., June 7.

Pennsylvania Grade Crude Oil Assn., Annual Meeting, Bradford, Pa., Thurs.-Fri., June 19-20.

Kentucky Oil & Gas Assn., Mid-Year Meeting, Lexington, Ky., Fri.-Sat., June 20-21.

American Society for Testing Materials, 44th Annual Meeting, Palmer House, Chicago, Ill., Mon.-Fri., June 23-27.

AUGUST

National Assn. of Petroleum Retailers, 9th Annual Convention, La Salle Hotel, Chicago, Ill., Tues.-Thurs., Aug. 19-21.

SEPTEMBER

American Chemical Society, Atlantic City, N. J., Mon.-Fri., Sept. 8-12.

National Petroleum Assn., Hotel Traymore, Atlantic City, N. J., Wed.-Fri., Sept. 17-19.

Society of Automotive Engineers, National Tractor Meeting, Schroeder Hotel, Milwaukee, Wis., Thurs.-Fri., Sept. 25-26.

National Lubricating Grease Institute, 9th Annual Meeting, Stevens Hotel, Chicago, Ill., Mon.-Tues., Sept. 29-30.

OCTOBER

Texas Mid-Continent Oil & Gas Assn., Beaumont, Tex., Tues.-Thurs., Oct. 9-11.

American Institute of Mining & Metallurgical Engineers, Petroleum Division, Dallas, Tex., Thurs.-Sat., Oct. 16-18.

Society of Automotive Engineers, National Aircraft Production Meeting, Baltimore Hotel, Los Angeles, Calif., Thurs.-Sat., Oct. 30-Nov. 1.

California Natural Gasoline Assn., Los Angeles, Calif., Fri., Oct. 31.

NOVEMBER

American Petroleum Institute, 22nd Annual Meeting, San Francisco, Calif., Mon.-Fri., Nov. 3-7.

NEWS

Immediate Federal Control of Oil Industry Would Result in 'Bottleneck', Says Defense Advisor Wilson to Cole Committee; Hunter Speaks for Compact 11

Humble Advances Texas, New Mexico Crude Prices 2 to 10c; Increase Averages Between 6 and 7c 11

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Chicago, 59 E. Van Buren Street, Telephone, Harrison 5901-2-3.

Subscription rate $3 per year in United States and Mexico; $4.50 in Canada and Foreign Countries. Current copies 15 cents, except special issues; back copies more than two months old 25 cents per copy.

THIS WEEK WITH NPN

LOST WITHOUT NPN

More evidence that Oil Marketers need and use NPN in their daily business is shown in a letter received from a southern oil marketer. This marketer wrote that he had moved his business from Georgia to Virginia and wanted to make sure that NPN was mailed to his new location. The subscriber writes: "Would like for you to let us have the issue that comes out today, as we feel completely lost without a copy of your news of the oil business."

INDIAN CALENDAR

Western India Oil Distributing Co., Bombay, India, sent NPN a copy of a premium being given customers. It was a small calendar . . . and calendars in India apparently are very important to keep track of the 27 National Holidays. Three days are given to Christmas, another holiday of two days is interspersed with a workday, and the King's Birthday, an important day in India, has not as yet been selected. All of which means that 27 holidays, plus the usual numbers of Sunday's should create a great deal of motorist demand for gasoline and oil.

CANADIAN ARMY

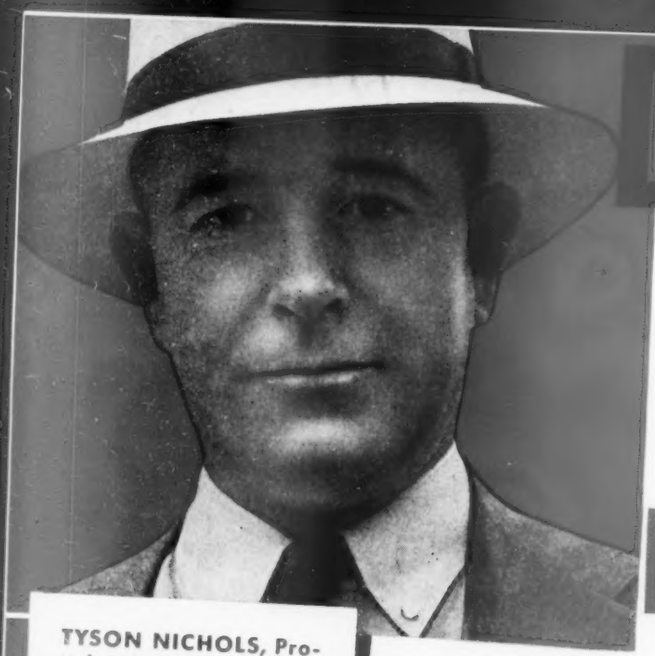
The war, of course, is making many changes in the Oil Industry. Especially is this so in Canada, a source of man power for Great Britain. An example of the change the war is effecting is strikingly shown in a letter NPN received from Mrs. A. L. LeBlanc, wife of one of NPN's Canadian subscribers. Mrs. LeBlanc writes that her husband's oil business, the Franklin-Penn Oil Co., located in Montreal, has been closed because her husband has signed up for active duty with the Canadian forces.

EXTRA COPIES

Many Spring Change-Over ideas are being published in NPN these days—practical ideas which oil marketers can use in their Spring Change-Over campaigns. Some oil marketers will want extra copies of these Change-Over aid issues aimed at helping marketers get things "ship shape." Copies are priced at 15c each and NPN will gladly mail copies to all lists of names furnished.

Does 4 times after taking

...Sets 12 Year Success Record



TYSON NICHOLS, Proprietor, Brunswick Oil Company, a Sinclair Distributor since 1928.

WHOLESALE RETAIL

BRUNSWICK OIL COMPANY

SINCLAIR H-C GAS

Gasoline-MOTOR OIL-Kerosene

TYSON G. NICHOLS, Proprietor

BRUNSWICK, MISSOURI

July 11, 1940

Mr. J. V. Dippel, District Manager,
Sinclair Refining Company,
Kansas City, Missouri.

Dear Mr. Dippel:

I want you to know how much I appreciate your recent visit and your congratulations on our business progress. Time has passed so swiftly that I hardly realize that our business relationship now mounts up to twelve years.

You may be interested to know that although the Brunswick Oil Company started in 1923, I did not acquire ownership of it until 1928. It was in that year that I arranged for the Sinclair franchise. There is no doubt in my mind that I made the right choice of a major company connection. My business has multiplied more than four times. In 1929, I had seven retail accounts – now I have 27. And in addition to our Brunswick bulk plant, we now have similar facilities in Salisbury and Sumner.

My farm business, particularly, shows a healthy increase, as evidenced by the fact that before switching to Sinclair products we had one truck calling on the farm trade. Today we have five. And our volume of farm business is way in excess of any of our competitors'.

Sinclair advertising and sales-helps have been a favorable factor for us. Sinclair campaigns and the quality of Sinclair products have won many friends for us. We have regularly taken advantage of the arrangement to buy Sinclair calendars. We have used Picture News for our stations and we are now mailing this publication to our farm trade. We also benefit from the wide distribution of Sinclair Credit Identification Cards.

I do not hesitate to recommend the Sinclair franchise to any distributor looking for a new connection. In all my twelve-year relationship as a distributor of Sinclair products, this fact stands out in my mind:- Never once have you encroached on my territory with your own stations.

Very truly yours,

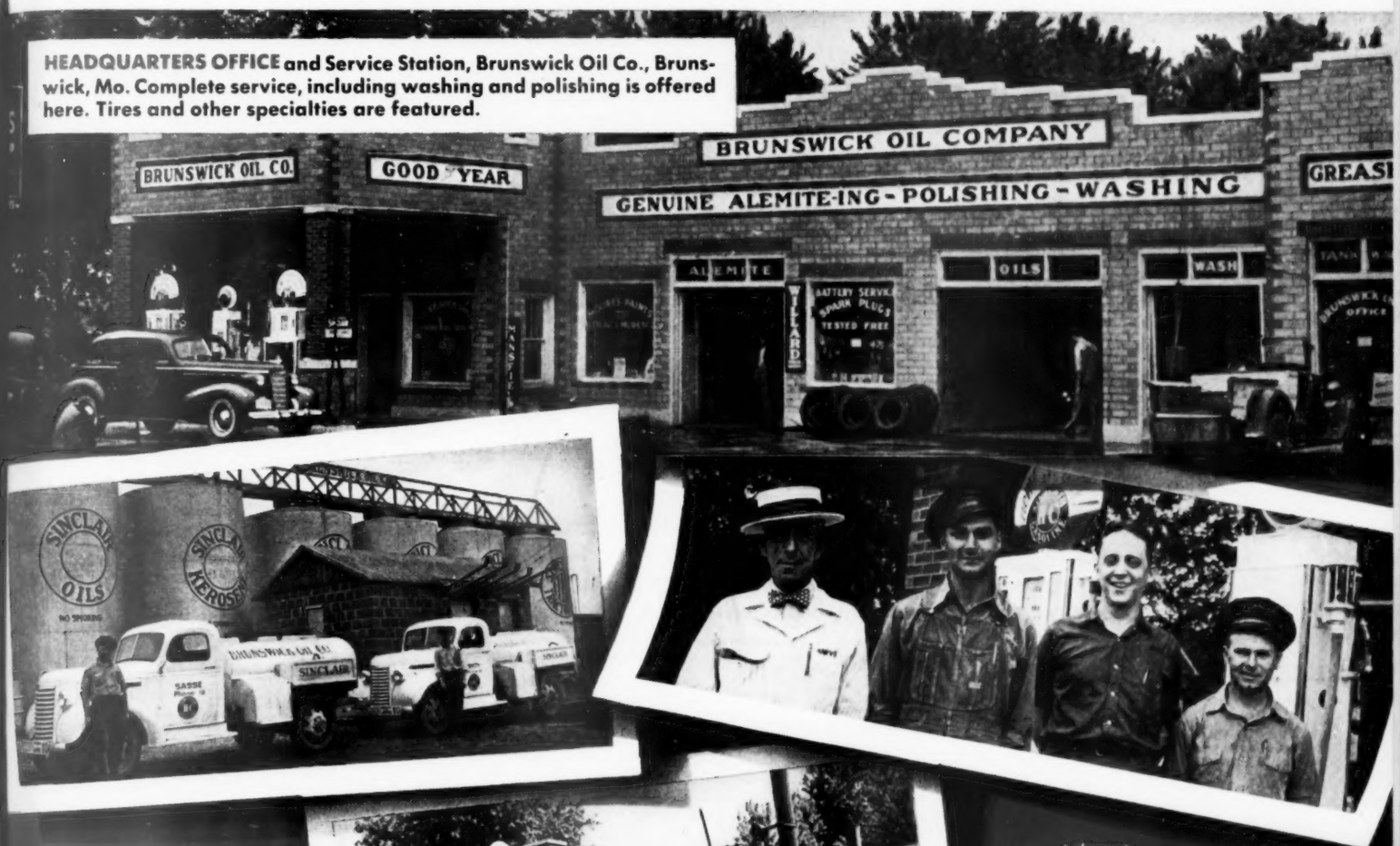
BRUNSWICK OIL COMPANY

Tyson Nichols

Tyson Nichols.

(below) Mr. C. W. Hickman is a dealer-customer of the Brunswick Oil Co. He is shown here at his station at Glasgow.

more business on Sinclair franchise!



HEADQUARTERS OFFICE and Service Station, Brunswick Oil Co., Brunswick, Mo. Complete service, including washing and polishing is offered here. Tires and other specialties are featured.

(above)
BULK PLANT and two delivery trucks of Brunswick Oil Company with their drivers Rudolph Sasse and Willard Smith.

(below)
27 retail accounts are served by Brunswick Oil Company—here is one at Sumner, Mo.

(above)
H. L. Veatch, a dealer customer of the Brunswick Oil Company is shown with his service station crew. Left to right, Mr. Veatch, Bill Grace, Henry Veatch and Bob Green.

(left)
Gehrig's Service Station, a dealer-customer at Salisbury, Mo.

For full particulars about the value of a Sinclair franchise, write the Sinclair office nearest you.

SINCLAIR

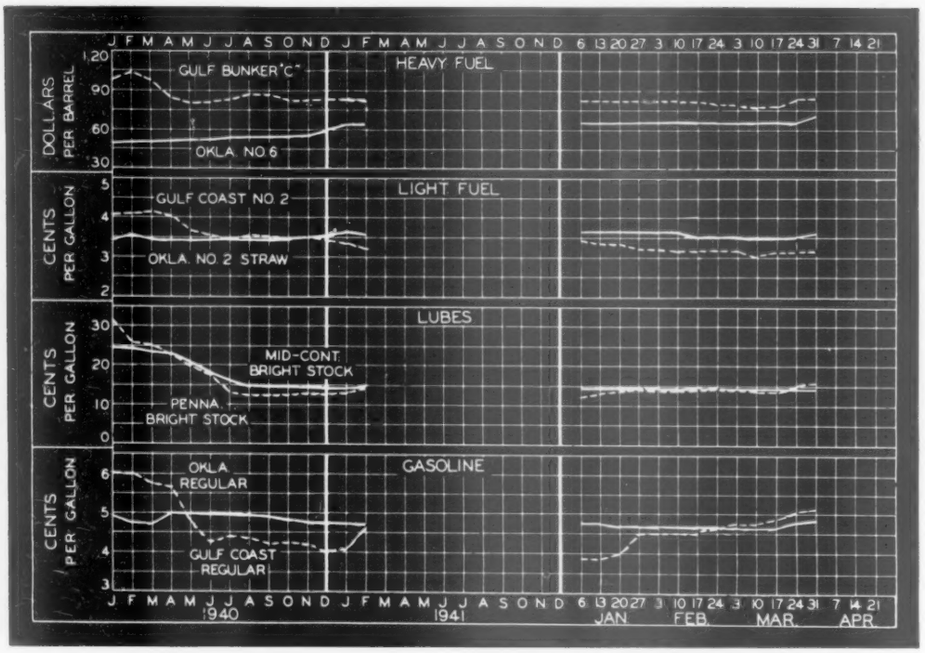
SINCLAIR REFINING COMPANY (Inc.) 630 Fifth Avenue, New York, N. Y.

2540 W. Cermak Rd.	573 W. Peachtree St.	1907 Grand Ave.	Fair Building	10 W. 51st St.
CHICAGO	ATLANTA	KANSAS CITY	FT. WORTH	NEW YORK

•STATISTICS•

REFINERY TANK CAR PRICES

(Monthly prices in graphs are averages of daily high and low prices shown in Platt's Oilgram. Weekly prices are averages of high and low prices shown in Monday Oilgram, and in National Petroleum News.)


J F M A M J J A S O N D J F M A M J J A S O N D 6 13 20 27 3 10 17 24 3 10 17 24 31 7 14 21
DOLLARS PER BARREL
GULF BUNKER "C"
HEAVY FUEL
OKLA. NO. 6
CENTS PER GALLON
GULF COAST NO. 2
LIGHT FUEL
OKLA. NO. 2 STRAW
LUBES
MID-CONT. BRIGHT STOCK
PENNA. BRIGHT STOCK
OKLA. REGULAR
GASOLINE
GULF COAST REGULAR
1940
1941
JAN.
FEB.
MAR.
APR.

Petroleum Supply & Demand, Comparative Analyses, January, 1941

(U. S. Bureau of Mines figures, thousands of barrels)

	January 1941 Total	January 1941 Daily av.	December 1940 Total	December 1940 Daily av.	January 1940	January 1939
LUBRICATING OIL:						
Production	2,943	95	2,865	92	3,308	2,527
Exports	534	17	588	19	1,068	851
Stocks	8,809	....	8,767	....	7,328	7,762
Domestic demand	2,367	76	1,875	60	2,054	1,609
WAX (thousands of pounds):						
Production	45,080	1,454	43,680	1,409	48,440	35,280
Imports:						
For domestic use	180	6	1,472	47	5,959	2,991
In bond	448	14	224	7	857	
Exports	13,229	427	8,778	283	21,142	18,342
Stocks	120,027	....	125,272	....	74,575	128,627
Domestic demand	37,724	1,217	31,538	1,017	35,187	20,642
COKE (short tons):						
Production	125,800	4,058	126,200	4,071	116,400	126,000
Exports	11,300	365	25,700	829	16,600	10,500
Stocks	406,000	....	487,000	....	628,000	717,000
Domestic demand	195,500	6,306	140,500	4,532	137,800	106,000
ASPHALT (short tons):						
Production	303,100	9,777	326,200	10,523	207,200	244,400
Imports (inc. natural)	300	10	29,200	942	4,600	12,700
Exports	21,900	706	28,700	926	19,300	3,300
Stocks	689,000	....	614,000	....	593,000	532,000
Domestic demand	206,500	6 661	238,700	7,700	149,500	212,200
ROAD OIL:						
Production	218	7	223	7	193	323
Stocks	717	....	624	....	763	830
Domestic demand	125	4	169	5	132	173
STILL GAS:						
Production (Millions cu. ft.§§)	20,326	656	21,553	695	20,984	20,068
MISCELLANEOUS:						
Production	282	9	273	9	292	165
Exports	39	1	47	2	40	5
Stocks	360	....	359	....	288	250
Domestic demand	242	8	219	7	240	173
UNFINISHED GASOLINE:						
Rerun (net)	—590	—19	—378	—12	—548	112
Imports in bond	....	....	....	....	....	....
Stocks	7,056	....	6,466	....	6,112	5,619
OTHER UNFINISHED OILS:						
Rerun (net)	902	29	1 195	39	1,620	1,143
Imports:						
For domestic use	275	9	234	8	573	437
In bond	78	3	....	....	240	180
Stocks	39,542	....	40,091	....	36,108	38,707
SHORTAGE:	764	25	219	7	688	177

§§Based on factor of 3,800 cu. ft. as equivalent to a barrel.

N. P. N. Gasoline Index

	Dealer T. W. Cents per Gallon	Tank Car Cents per Gallon
Mar. 31	8.84	3.28
Month ago	8.65	5.11
Year ago	9.51	5.84

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 9 wholesale markets for regular-grade gasoline.

Crude Oil Stocks

(U. S. Bureau of Mines figures, thousands of barrels)

Grade or Origin	Mar. 15	Mar. 22	Change from Mar. 15
Pennsylvania Grade	4,288	4,230	— 58
Other Appalachian	1,361	1,410	+ 49
Lima-Michigan	1,132	1,122	— 10
Illinois-Indiana	21,388	21,444	+ 56
Arkansas	3,033	3,016	— 17
Kansas	[1]8,791	8,747	— 44
Louisiana:	12,466	12,536	+ 70
Northern	4,270	4,236	— 34
Gulf Coast	8,196	8,300	+ 104
Mississippi	826	836	+ 10
New Mexico	7,081	7,211	+ 130
Oklahoma	[1]64,008	64,189	+ 181
Texas:	84,197	83,476	— 721
East Texas	20,217	19,908	— 309
West Texas	16,350	15,273	—1,077
Gulf Texas	22,670	23,330	+ 660
Other Texas	24,960	24,965	+ 5
Rocky Mountain	15,569	15,668	+ 99
California	37,416	37,458	+ 42
Foreign	2,748	2,514	— 234
Total U. S. refinable	264,304	263,857	— 447
Heavy in California	12,082	12,248	+ 166

[1] Revised.

Ohio Gasoline Consumption

(Compiled by Ohio Petroleum Marketers Assn. from state tax reports)

Month	Gallons
Jan., 1940	97,218,118
Jan., 1941	110,583,259
Gain	13,365,141
% Gain	13.75
Year	
1931	984,800,000
1932	903,091,462
1933	886,641,024
1934	955,469,314
1935	1,014,925,319
1936	1,133,834,593
1937	1,234,481,548
1938	1,215,634,621
1939	1,302,378,618
1940	1,398,039,100

Pacific Coast Taxable Gasoline Distribution

(Reported by California Oil & Gas Assn. Figures in Gallons)

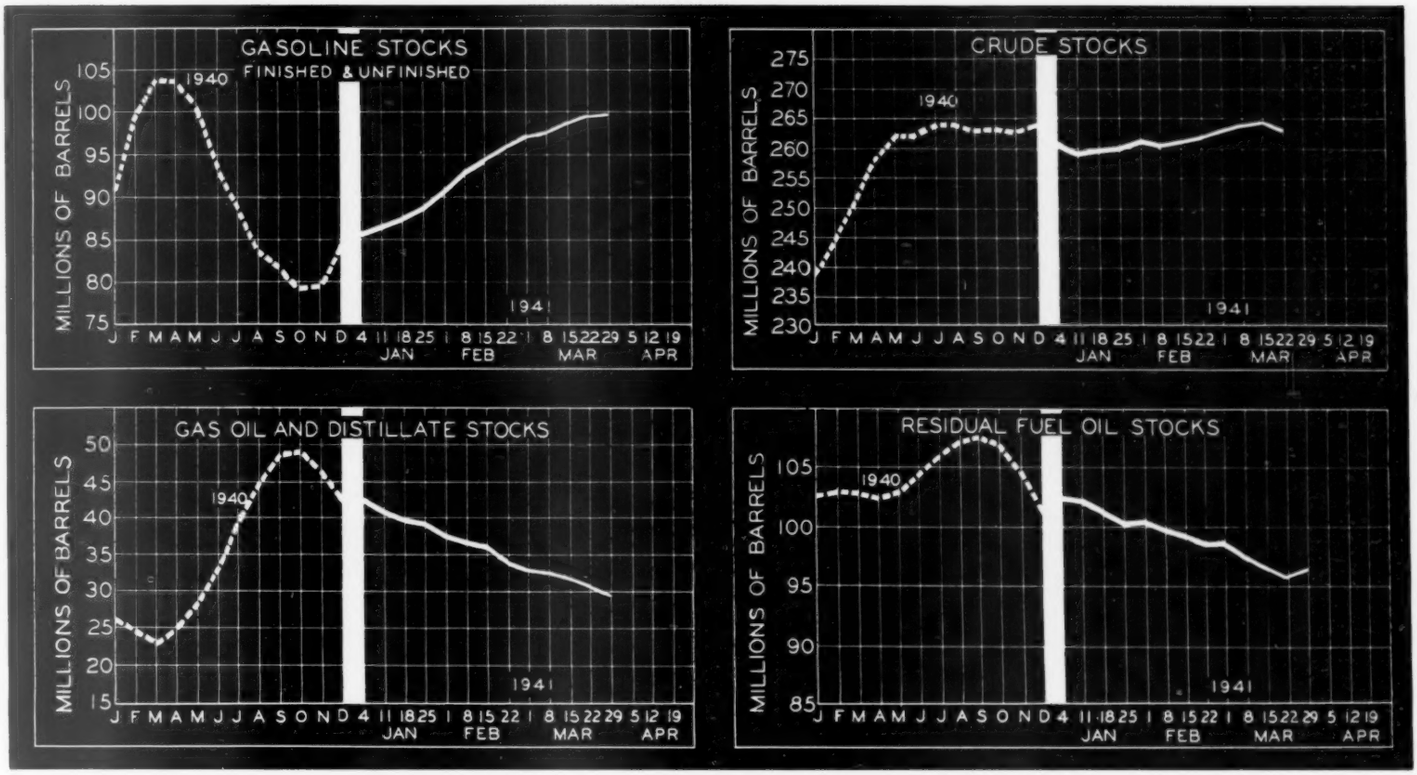
	Jan., 1941	Jan., 1940
Arizona	9,339,999	8,753,613
California	151,201,697	140,735,237
Nevada	2,359,246	2,061,105
Oregon	17,918,607	15,992,476
Washington	26,339,636	23,439,038
Total	207,159,185	190,981,469

Canadian Crude Oil Production, 1938-1940

(Compiled by Dominion Bureau of Statistics. Figures in barrels, and subject to revision.)

	1940	1939	1938
January	486,859	533,166	457,506
February	655,586	358,176	413,244
March	570,131	385,273	480,901
April	634,869	559,368	464,418
May	676,486	713,947	566,473
June	657,098	821,308	538,936
July	877,133	899,169	701,813
August	868,651	795,844	825,546
September	841,752	720,866	892,732
October	817,596	816,257	688,825
November	893,438	731,209	445,640
December	738,454	502,920	489,423
Total	8,718,053	7,837,503	6,965,457

•STATISTICS•


GASOLINE STOCKS
FINISHED & UNFINISHED
MILLIONS OF BARRELS
1940
1941
CRUDE STOCKS
GAS OIL AND DISTILLATE STOCKS
RESIDUAL FUEL OIL STOCKS
J F M A M J J A S O N D 4 11 18 25 1 8 15 22 1 8 15 22 29 5 12 19
JAN FEB MAR APR

A.P.I. Report of Refinery Operations

(Figures in Thousands of Barrels of 42 Gallons Each)

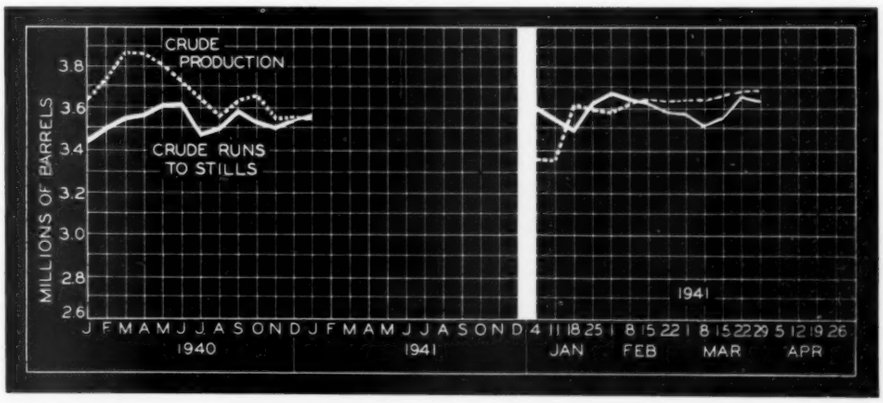
Districts	Daily Average Crude Runs to Stills, Week Ended		Per Cent of Reporting Capacity Operated, Week Ended		Gasoline Production at Refineries incl. Natural Blended, Week Ended		Total Stocks Finished & Unfinished Gasoline, Week Ended		Total Stocks Gas Oil & Distillates, Week Ended		Total Stocks Residual Fuel Oil, Week Ended		Stocks Aviation Gasoline Included in Finished & Unfinished Gasoline Total, Week Ended	
	Mar. 29	Mar. 22	Mar. 29	Mar. 22	Mar. 29	Mar. 22	Mar. 29	Mar. 22	Mar. 29	Mar. 22	Mar. 29	Mar. 22	Mar. 29	Mar. 22
East Coast	595	589	92.5	91.6	1,577	1,501	20,495	20,971	8,206	9,068	8,665	7,688		
Appalachian	134	131	94.4	92.3	420	447	3,231	3,237	392	381	462	461	**East Coast**	
Ind., Ill., Ky.	586	604	87.5	90.1	2,153	2,235	19,818	19,589	2,398	2,425	2,940	2,910	595	613
Okla., Kans., Mo.	282	281	87.3	87.0	1,112	*1,004	8,941	8,886	1,239	1,239	1,904	1,902	**Interior**	
Inland Texas	103	122	61.7	73.1	525	523	2,282	2,321	322	323	1,432	1,433	834	808
Texas Gulf	848	868	88.8	90.9	2,725	2,798	15,526	15,100	5,282	5,071	7,010	6,899		
La. Gulf	122	136	76.3	85.0	324	348	3,429	3,442	1,034	1,024	2,314	2,412	**Gulf Coast**	
N. La. Ark.	50	48	96.2	92.3	148	140	580	542	313	301	545	535	3,252	3,186
Rocky Mt.	58	57	85.3	83.8	240	222	1,740	1,708	169	169	480	481	**California**	
California	512	483	70.1	66.2	1,481	1,426	16,635	16,705	10,084	10,074	68,740	69,218	1,516	1,586
Reported	3,290	3,319	84.1	84.9	10,705	10,644	92,677	92,501	29,439	30,075	94,492	93,939	6,217	6,193
Estimated Unreported	335	336			1,355	1,450	7,050	7,040	510	520	1,660	1,650	245	245
U. S. Total†	3,625	3,655			12,060	12,094	99,727	99,541	29,949	30,595	96,152	95,589	6,462	6,438
U. S. Total 3-29-40†	3,551				11,175		103,283		23,236		102,870		4,570	

*12% of reporting capacity in this district did not report gasoline production. †Estimated, U. S. Bureau of Mines basis.

U. S. Crude Oil Production

(American Petroleum Institute figures)

	WEEK ENDED Mar. 29 Barrels (Daily Average)	Mar. 22 Barrels (Daily Average)
Oklahoma	408,450	408,750
Kansas	211,650	216,000
Nebraska	4,350	4,300
Texas	1,441,300	1,366,800
Louisiana	306,050	304,550
Arkansas	70,950	71,200
Mississippi	17,750	18,450
Illinois	325,200	330,200
Indiana	19,850	21,650
Eastern (Ill. & Ind. excluded)	93,200	85,850
Michigan	37,900	37,950
Wyoming	74,350	74,400
Montana	18,200	18,200
Colorado	3,850	3,850
New Mexico	109,000	108,800
California	604,500	610,100
Total U. S.	3,746,550	3,681,050
Crude Imports	205,428	115,857
Total New Supply	3,951,978	3,796,907


CRUDE PRODUCTION
CRUDE RUNS TO STILLS
MILLIONS OF BARRELS
1940
1941
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D. J. Burke

New Jobber Division Chairman Of Kentucky Petroleum Marketers

Lexington, Kentucky is well acquainted with D. J. Burke, co-owner of Kentucky Independent Oil Co. and probably the only man in the state who always wears odd socks—for luck.

At the fifteenth annual convention of the Kentucky Petroleum Marketers Assn., Mr. Burke was elected Jobber Division chairman.

There is an axiom about knowing the people with whom you do business, and Mr. Burke—born, reared and educated in Kentucky—does much of his business in the Blue Grass state.

In 1926, at the age of 22, he joined the Indian Refining Co. in Lexington. When Indian became affiliated with The Texas Co. in 1931, Texaco moved him to Covington where he remained until 1935. At this time, he resigned to enter into partnership with O. A. Bakhuas and thus the Kentucky Independent Oil Co. was formed. This company made its first delivery Sept. 8, 1935 to a customer who remains an "active account".

Mr. Burke was born in Lexington, Jan. 21, 1904, graduated from Lexington High School and attended the University of Kentucky. He is president of the Central Kentucky Tire Co., Lexington, and its affiliated companies; vice-president of the Thomas Oil Co., Greensboro, N. C.; and vice-president of the Century Oil Co., Jackson, Miss., a producing company.

Outside of business, Oil Man Burke is interested in baseball and horse racing and is a member of the Lexington Cooperative Club and the Lexington Pyramid Club. He is married and has a young daughter.

NATIONAL PETROLEUM NEWS

VOLUME 33 WEDNESDAY, APRIL 2, 1941 NUMBER 14

Texas Crudes Raised 2 to 11c Oklahoma Up

N. P. N. News Bureau

TULSA, April 1.—Humble Oil & Refining Co. started the ball rolling with a 2 to 11c per bbl. advance in its crude prices in Texas and New Mexico fields late last week and today the upward trend spread to the Mid-Continent, with Standard Oil Co. of Indiana, Carter Oil Co. (Standard of New Jersey subsidiary), and Gulf Oil Corp. announcing 5c per bbl. increases in their postings in Oklahoma, Kansas and North Texas.

Late March 31, Sohio Corp., crude purchasing subsidiary of Standard Oil Co. of Ohio, largest buyer of Illinois crude, announced a 5c increase in its Illinois posting bringing the price up to $1.20 per bbl.

Humble's advance took in all Texas and New Mexico fields where the company buys crude, and the boost was its first general change since Oct. 2, 1939.

"We will change our price bulletin so as to effect an average increase of between 6c and 7c per bbl.," Humble announcement said.

For the most part, gravity range in most fields where the company buys, was unchanged, beginning with below 20 gravity and extending up to 40 and above.

Refugio and Mirando crudes were increased 7c per bbl. Texas Gulf Coast oil was advanced 10c, including Hastings and Racoon Bend.

Divided Into 2 Groups

Crude formerly purchased on the Anahuac-Dickinson schedule was divided into 2 groups; one group which was increased 7c above the former Anahuac-Dickinson schedule includes Anahuac, Angleton, Cedar Point, Fishers' Reef, Hull (old and new), Pierce Junction, Red Fish Reef and Turtle Bay fields; the other group which was increased 2c per bbl. above the former Anahuac-Dickinson schedule includes crude purchased in Dickinson, Gillock, Hardin, League City, and Rowan fields.

East Central Texas and West Central Texas crudes were increased 5c per bbl.

West Texas and New Mexico

(*Continued on page* 20)

At Cole Hearing

Dr. R. E. Wilson

Illinois Crude Hiked by Sohio

CLEVELAND, April 1. — Sohio Corp. today posted a 5c per bbl. increase in its posted prices for Illinois crude oil, bringing the price the company will pay for the major portion of its purchases to $1.20 per bbl.

"Effective 7 a. m. April 1, 1941, and concurrently with its change from 98% to 100% tank tables (as previously announced), Sohio Corp., subsidiary of Standard Oil Co. of Ohio, announces an increase of 5c per bbl. in its posted well price for purchases of crude oil in Illinois and Indiana," the company's announcement said.

"This means an increase from $1.15 to $1.20 per bbl., except where special prices prevail account of local transportation or low gravity factors."

Last previous change in Sohio's posting for Illinois crude was 10c advance to $1.15 per bbl. on Aug. 21, 1940, when daily average production in the state had dropped approximately 150,000 bbls. from its flush peak of 525,000 bbls.

Michigan Crude Hiked

CHICAGO, April 1.—Pure Oil Co. today announced a 5c increase, effective April 1, in prices it will pay for Michigan crudes, to $1.27 for Midland, and $1.22 for Sherman, Clare-Freeman.

Pure also advanced its prices for Illinois Basin crude, 5c to $1.20 per bbl., effective April 1, a company spokesman said.

Wilson Sees No Need For Federal Control

N. P. N. News Bureau

WASHINGTON, March 27.—Dr. R. E. Wilson told Cole House Oil Investigating subcommittee at its opening session this week that he regards immediate federal steps for emergency control of oil industry as unnecessary to the defense program.

Appearing in his official capacity as Office of Production Management oil consultant at committee's "final" hearings, Dr. Wilson made the above statement in response to request of Chairman William P. Cole, Jr., for an opinion on oil recommendations contained in National Resources Planning Board report, which was submitted to Congress earlier this month by President Roosevelt (see NPN, March 19, p. 11).

Others testifying before the Cole Committee were: J. C. Hunter, president of Mid-Continent Oil & Gas Assn.; speaking for Interstate Oil Compact Commission; Major D. G. Lingle, joint aeronautical board; Major C. V. Morgan, speaking for Secretary of War and Admiral H. A. Stuart, Secretary of Navy's office.

Dr. Wilson told committee that Resources Board program for immediate federal control of oil industry "might very easily" result in "bottleneck" in industry's defense efforts, adding that neither he nor the OPM had ever been consulted about the recommendations.

Price Control Not Needed

Saying he could not agree with report's conclusions beyond its stressing the importance of oil to national defense, Dr. Wilson stated defense requirements do not necessitate establishment of "emergency powers adequate to control the allocation of production and refining among the various districts and to control the prices of petroleum and its products in relation to other fuels."

Federal Estimates

Bureau of Mines now compiles up-to-date estimates of requirements for oil recommended in Resources Board report, Dr. Wilson continued, saying report's proposed creation of a federal oil conservation body apparently overlooks fact that such a body already exists in the Interior Department. Authors of report, however, might have had something "much more drastic in mind," he added.

Disagrees With Report

"There can be no dispute with regard to the first statement (in the Resources Board report) that petroleum products are absolutely essential to the national defense," Dr. Wilson told committee. "Beyond that, however, I cannot agree with the statement, from my knowledge of the situation. To say that immediate steps are necessary

Mid-West Shippers See Rate Decision As a 'Door Opener'

N. P. N. News Bureau

TULSA, March 31. — Southwestern rail-shipping refiners are virtually unanimous in their opinions that even though rails prescribe only the maximum petroleum rates set forth in the Interstate Commerce Commission's decision in the Petroleum Rail Shippers Assn. complaint (NPN, March 26, p. 5), they will at least be in position to hold their present volume of business in the Mid-West and North. But there is a strong feeling that rails may go one step farther and prescribe either multiple-car "pipeline-competitive" rates or single-car rates calling for minimum reductions of about 1c a gal. into the consuming area.

It is difficult for southwestern refiners to analyze the ICC decision, and without some indication from the rails and pipelines as to their prospective actions, impossible to plot their next course. There have been no announcements at all from

(*Continued on page* 23)

to establish emergency powers adequate to control the allocation, production, and refining among the various districts and to control the prices of petroleum and its products in relation to other fuel, certainly does not seem to me to be necessary.

"We have gone into this and if we have one industry, which of any industry in the whole country, can take national defense in its stride and meet all possible demands upon it without calling on the government for aid, it is the petroleum industry, and to impose a super-regulation upon such an industry, at a time when individual enterprise should be at a premium, would seem to me might very easily constitute a bottleneck rather than what we need during the next critical months."

Dr. Wilson said that "creation of a federal oil conservation board, (as proposed in Resources Board report), apparently overlooks the fact there is an oil conservation body, but they may have had something in mind which would be much more drastic. There is, however, the very efficient, though small group in the Department of Interior which does co-operate with the states in endeavoring to minimize waste and co-operate with the oil Compact Commission, which has that duty.

Estimates Now Made By Government

"It (report) says 'for emergency purposes there should be up-to-date estimates for oil and gas.' There are up-to-date estimates. As I say, the federal government today gets these out every month as to requirements and in addition, of course, we are continually studying the specific defense requirements, which are, however, a relatively small part of the total requirements. I, therefore, do not agree with the main conclusions of the report."

Questioned by Chairman Cole regarding Illinois situation, Dr. Wilson said he thought it "unfortunate. They are dissipating their own reserves at an undue rate. On the other hand, I think that most of the waste which is taking place in a state like Illinois, has been waste of capital and labor, and building of unnecessary refineries and unnecessary pipelines, rather than waste of oil, although there has been some waste of oil. I understand, however, that there is an excellent prospect that the Illinois legislature will pass a conservation statute at this session. And also, Illinois is past the point where there is much disturbance or waste involved in the operation."

Chairman Cole, who had announced hearings were in response to letters of President asking consideration of federal oil conservation legislation, in light of the international situation, and of southeastern pipeline projects (see NPN, Dec. 25, p. 1 and Feb. 12, p. 11) told reporters at conclusion of first day's session that appearance of Dr. Wilson had followed request from the Chief Executive. Mr. Cole declined further comment except to remark: "Did you ever see a letter written on the U.S.S. Potomac?"

'Oil Industry Ready For Any Demand'

Dr. Wilson, in prepared statement read to committee, emphasized oil industry is ready to meet any defense demand—only situation causing concern being lack of transportation facilities to Atlantic Coast should a naval war in Atlantic interfere with tanker shipments around Florida.

Questioned by House Interstate and Foreign Commerce Committee Chairman Clarence F. Lea (whom Chairman Cole said had succeeded Rep. Herron Pierson, Tenn., as member of House Oil Investigating committee), Dr. Wilson said military needs in East could be met, but civilian consumption on Atlantic Seaboard would be seriously curtailed if submarine operations made convoying of tankers from Gulf Coast necessary.

Private enterprise should be encouraged to build gasoline pipelines in the Southeast, Dr. Wilson said, in response to Lea's inquiry as to his views, saying he did not think the government should undertake such projects. Dr. Wilson also stated a new crude line had been proposed from either East St. Louis or Wood River, Ill., to Marcus Hook, Pa., and that he had asked certain oil companies to consider this project, but he was uncertain whether private capital could be interested.

Reconvenes Hearings

W. P. Cole, Jr.

Sees Possible 'Bottleneck'

Mr. Lea then asked Dr. Wilson whether Congress should require certificates of convenience and necessity, should federal right of eminent domain be granted pipelines, and was told such a policy would be all right for gasoline lines, but might cause much waste in oil fields, through construction delays, if applied to crude lines.

Replying to committee questions, Dr. Wilson said he favored federal representation on the Interstate Oil Compact Commission, suggesting present invitation to send a representative to participate in sessions should be accepted, rather than insisting on voting membership, in view of point now reached by Compact in state legislatures. Should government want to send 2 or 3 representatives, compact commission will amend its invitation accordingly, he said, adding federal representatives might include a petroleum economist and an engineer.

Committee also asked numerous questions about international situation, and Dr. Wilson stated Germany has an estimated crude oil supply of 180,000 bbls. daily in sight for next year. This, he declared, would be adequate to supply German army with gasoline, but necessarily would force severe curtailment in civilian consumption. There is, however, some evidence of an acute shortage of aviation lubricating oils and heavy lubricants in Germany, he said.

Foreign Oil Outlook Discussed by Wilson

Following conclusion of public hearings, Dr. Wilson met with committee in executive session, at which time it is understood that he discussed the oil situation in various foreign countries in detail, and the international situation generally.

Dr. Wilson estimated Germany's synthetic petroleum production at between 70,000 and 75,000 bbls. daily, despite heavy British bombing attacks —total capacity of such plants, which are of heavy construction and presumably difficult to damage, being around 100,000 bbls. daily. Germany's own oil production was estimated at between 40,000 and 45,000 bbls. daily, while Russian imports were placed at 20,000 bbls., and Roumanian at 30,000 bbls. per day.

Explaining failure of German air force to conduct more extended bombing attacks on England is probably due to inability to maintain supplies of gasoline at 200 airfields scattered from Norway to France, rather than to any shortage of aviation gasoline, Dr. Wilson said that the 100-octane gasoline available to the British is giving them a 25% advantage in power over German planes

Cole House Testimony Outlined For First 2 Days of Oil Hearings

N. P. N. News Bureau

WASHINGTON, April 1.—Highlights of the first two days' hearings before the Cole House Oil Committee are outlined briefly as follows:

March 27

Dr. R. E. Wilson, Office of Production Management oil consultant, said that oil industry is prepared to meet any war emergency, except for possible difficulties in tanker transportation from Gulf Coast to Atlantic seaboard in event of naval war in Atlantic.

March 28

Judge J. C. Hunter, representing Interstate Oil Compact Commission, said Commission wants its authority (expiring next September) extended as is, and declared Commission has not seen nor does it foresee any need for federal oil regulation proposed in National Resources Board report.

Maj. D .G. Lingle, joint aeronautical board, said Army-Navy anticipate need for 24,400 bbls. daily of 100-octane aviation gasoline.

Maj. C. V. Morgan, appearing for Secretary of War's office, said maximum Army-Navy war effort (exclusive of aviation gasoline requirements) would require 10% of nation's total crude oil production—a statement which Chairman Cole said is at variance with War Secretary Stimson's estimate of possible 20%.

Admiral H. A. Stuart, representing Secretary of Navy's office, stated construction of gasoline pipelines in Southeast is desirable if not necessary from a military standpoint, adding that Plantation line would take the place of 6 tankers.

which must operate on 87- and 90-octane grades.

Members of the House Oil Investigating committee attending regularly current hearings are Chairman Cole and Reps. Lea of California, and Pehr G. Holmes of Massachusetts.

Hunter Testifies For Compact

Extension of present authorization of Interstate Compact Commission beyond its expiration date next summer was urged by Judge J. C. Hunter, Abilene, Tex.

Speaking as chairman of committee appointed by Gov. Leon C. Phillips, of Oklahoma, to present views of Compact Commission to House oil investigating group, Judge Hunter stated commission feels no need for additional powers, but does think it merits continued confidence of President and Congress.

Commission "prefers to remain a creature dependent upon state sovereignty with its activities administered by public officials of its respective member states through the exercise of police power in dealing with the problems of the petroleum industry incident to the prevention of avoidable waste," Judge Hunter declared in his prepared statement.

Hunter Questions 'Control'

Referring to National Resources Planning Board report submitted to Congress last week by President Roosevelt, Judge Hunter said: "No need has yet arisen, nor can we visualize any need, for such economic control with respect to petroleum resources."

Price control and price fixing as well as designation of preferred uses of petroleum products, recommended in Resources Board report, are properly beyond scope and powers of Compact, he stated.

Previously, Judge Hunter had stated: "Those who would supplant this (Compact) Commission with a more centralized control are answered by the effective performance and ever-increasing efficiency of the commission's work. The record of accomplishment of the Commission is answer to such criticism.

"Governmental requirements for the continuing development of the industry cannot be satisfied by any centralized power. State control through the medium of the Compact Commission, is enforced by the strongest of all powers, that of public opinion which is amenable to the necessary changes to meet the requirements of various local conditions."

Maj. D. G. Lingle, joint aeronautical board, told House oil investigating committee that Army and Navy now have anticipated 100-octane aviation gasoline demand of 24,400 bbls. daily, but declined to amplify his statement, saying any detail would have to be supplied committee in executive session.

Talks for Compact

J. C. Hunter

Army's 'Gas' Needs Told by Morgan

Maj. C. V. Morgan, who said he had been designated by Secretary of War to appear before committee, but who stated, under questioning of Chairman Cole, that he had not conferred with Secretary Stimson on his testimony, presented figures to committee indicating Army is now using 2% of nation's total oil production. A maximum war effort would see Army and Navy using 10% of such production, exclusive of aviation gasoline requirements, he added.

Chairman Cole then produced a letter from War Secretary Stimson mentioning a possible 20% war effort requirement, whereupon Major Morgan said he did not know the source of this information —his figures being those of the War Department Commodities Division.

Major Morgan also presented committee with figures indicating Army needs in the area do not require construction of gasoline pipelines in the Southeast, following which chairman Cole confronted Army office with another Stimson letter (to President Roosevelt) favoring construction of gasoline pipelines in the Southeast.

Cole Questions Morgan

"The opinion of the Secretary of War undoubtedly contradicts your opinion as stated here this morning," Chairman Cole said. This brought reply from Major Morgan that Secretary Stimson's letter considered Atlantic Seaboard situation as a whole, rather than the special need of the Army for petroleum products in southeastern states.

Admiral H. A. Stuart, director of Naval Petroleum Reserves, speaking as representative of Secretary of Navy's office, said construction of new gasoline pipelines in southeast are "desirable, if not necessary from a military standpoint," adding that proposed Plantation Pipeline from Baton Rouge, La., to North Carolina would perform transportation service equal to 6 tankers. In response to inquiries of Chairman Cole, Admiral Stuart said there are adequate supplies of fuel oil on the West Coast for the Pacific fleet, and that Navy Department is taking no position on the Cole federal oil bill which was pending before Congress last session.

Chairman Cole announced at conclusion of day's hearings that House oil investigating committee probably will make inspection trip into Louisiana and Arkansas during week of April 7, and may attend quarterly meeting of Compact Commission, now scheduled for April 14 in New Orleans. Committee also might inspect southeastern pipeline situation if that proves necessary, he added.

Wilson's Complete Text

Following is Dr. Robert E. Wilson's complete statement given before the Cole Committee:

The Petroleum Unit, Materials Branch of the OPM, and its predecessor under the Advisory Commission to the Council of National Defense, has been en-

(*Continued on page* 14)

Army-Navy Bid Invitations Show Big 'Gas' Demand Hike

N. P. N. News Bureau

WASHINGTON, March 28.—Huge Army-Navy demand for motor gasoline, growing out of defense program, is reflected in bid invitations now being issued by Treasury Procurement Division for July-September quarter.

Sixth region Army and Navy station requirements of tank car gasoline (regular grade) are estimated at 1,626,000 gals. in bid invitation as against 407,000 gals. last year. Representing increase of 400%, this is exclusive of 102,000 gals. of tank car gasoline (premium grade), of which 79,000 gals. is to be bought at Fort Lewis, Wash., and 23,000 gals. at Fort Ord, Calif. (for tank battalion).

Gallonage estimated (regular grade) for this year by posts, together with those for last year, shown in brackets, follow: Fort Ord, Calif., 925,000 (none); Fort Huachuca, Ariz., 63,000 (35,000); March Field, Calif., 36,000 (none); North Island Naval Air Station, San Diego, Calif., 150,000 (none); Naval Air Station, San Pedro, Calif., 11,250 (none); Muroc Bombing Field, Calif., 10,000 (none); Presidio of Monterey, Calif., 50,000 (none); Quartermaster, San Francisco, 50,000 (47,000); Hamilton Field, Calif., 50,000 (none); McClellan Field, Calif., 45,000 (none); Fort MacArthur, Calif., 15,000 (15,000); Naval Ammunition Depot, Hawthorne, Nev., 20,000 (10,000); Fort Lewis, Wash., 137,500 (270,000); McChord Field, Wash., 63,250 (12,000); Planehaven, Calif., 28,000 (none).

Fifth region Army stations are estimated as buying 468,400 gals. of tank car gasoline (regular grade) during July-September quarter, representing increase of 300% over 158,750 gals. last year.

This year's gallonage estimated by posts, together with those for last year, follow: Fort Warren, Wyo., 290,000 (77,000); Fort Logan, Col., 49,000 (42,000); Fitzsimmons Hospital, Col., 50,000 (39,750); Lowry Field, Col., 41,000 (none); Fort Douglas, Utah, 38,400 (none).

Hamilton Refers Queries On 'Pilgrimage' To Ickes

N. P. N. News Bureau

EL DORADO, April 1. — Asked for details regarding his efforts to organize a pilgrimage to Interior Secretary Ickes to plead for federal control of oil, D. P. Hamilton, Root Petroleum Co. official, told NATIONAL PETROLEUM NEWS that:

"If there's any truth in the report and if there's to be any publicity given out, then it should come from Mr. Ickes."

Meanwhile, Washington reports indicated Interior Department is ignorant of any plans proposed by anyone for government control intended to make the oil industry more profitable.

"I know a Mr. Duke who is head of the New York City law firm of Snider, Duke and Landis," was Mr. Hamilton's answer to question of who the "Mr. Duke" was who is said to have helped in the promotion of the proposed pilgrimage. But the Root official did not connect the head of the law firm with the Ickes pilgrimage.

Wilson's Complete Statement Given At Cole Oil Hearing

(*Continued from page* 13)

gaged since June 20, 1940, in analyzing the prospective requirements of the armed forces and the country as a whole for petroleum and its various products under different defense programs and possible war situations, and comparing these requirements with the ability of the industry to produce, refine, and transport the products which would be required. Details of the individual situations can only be supplied in executive session, but I am glad to present here a brief summary of the overall picture as we see it.

The actual estimation of defense requirements for various situations is not a simple task, and does not lead to any single figure for such requirements, because both the peacetime and the wartime demands for petroleum products will increase steadily as our armament program provides our Army and Navy with increasing quantities of mechanical equipment. In addition to these growing peacetime needs of the services, the industry is already beginning to experience a substantial increase in demand due to increased industrial requirements and increased civilian use by new employes of industry. As a result of all this, we estimate that even under peacetime conditions the total domestic demand for petroleum products during 1941 will be 8% or 9% greater than the total domestic demand during 1940, which was in itself a new high record.

It should be noted that the above-mentioned increased training activities involve the use of a substantial part of the planes, tanks, motor equipment, and naval vessels now available to us, and hence the further increase in demand due to actual participation in war would not be nearly as large as would be calculated by figuring what all our military equipment would consume. The percentage increase in demand for various products naturally differs considerably, but by and large it may be said that if we should become involved in an all-out war effort by the end of this year the further increase in demand for the major petroleum products would be somewhere between 5% and 10%. This figure may seem small in view of the obviously large demands of mechanized war and the difficulties this country experienced in meeting the great increase in demand during the last war.

It must be remembered, however, the petroleum industry's production of gasoline has increased about twelve-fold since 1916, and that our shut-down refining capacity today is much larger and more efficient than was the entire refining capacity of the country even in 1918. Also, there was then no large available reserve of shut-in crude production such as exists today. This lack of shut-in production was the fundamental cause of the sharply increased prices and gasoline-less Sundays found necessary during the last war.

Incidentally, it might be pointed out that the entire military activities of Germany and Italy, plus the industrial and other activities of these countries and of the occupied areas of Western Europe, are being carried on with an amount of petroleum plus synthetic products which is only about 5% of our present domestic production.

Able To Meet Demand

Production—Thanks to proration, and other conservation activities, the production branch of the petroleum industry is today able to meet any increase in demand which may conceivably be made upon it. Total proven reserves are the highest in the history of the industry. We have detailed estimates by States which indicate that it would easily be possible to make a 30% increase in our present high rate of crude production and continue this for a two year period without any major new discoveries or any unusual amount of drilling. Existing proration laws have not only resulted in the conservation of much oil and gas and the reduction of overall costs of production, but also in the building up of a tremendous underground reserve, particularly in Texas and Louisiana, which is available merely by the opening of valves. A moderate amount of new pipe line construction would, of course, be needed to take care of the expanded output of various fields and to get this crude to the refineries which could use it.

No branch of the industry is in better shape to meet emergency demands than is the producing end, but to remain in this healthy condition obviously requires the continuation of exploration, wildcatting, and reasonable drilling activities.

Could Hike Refining

Refining—In refining, the degree of expansion which could be made on short notice is not quite as large as in the case of production, but even here, the refining capacity of the country could be increased fully 25% merely by starting up capacity which is now shut down. To go this far would mean some reconditioning of older plants, and part of the equipment which would have to be used is relatively inefficient, because naturally the industry has in general shut down its obsolescent and less efficient equipment so far as possible.

On the other hand, as I have said, this shut-down capacity is greater and more efficient than the entire capacity of the industry at the close of the last war. Again, to remain in this favorable position the refining industry must continue to build to keep pace with the growth of peacetime demand, and keep the reserve of 20% to 25% of shut-down capacity available for emergency demands.

Transportation Adequate

Transportation—In the field of transportation the ability to expand is again present, except for one special situation. A 20% expansion in the total amount of crude and products transported by pipe lines could be handled on short notice and with very little additional construction, and the same is true of transportation by tank car in the interior of the country.

The only possible bottleneck which gives us concern is in tanker transportation to the East Coast. About 95% of the petroleum products consumed by the East Coast States is delivered there by tanker, either in the form of crude or refined products, and mainly from the Gulf Coast. The movement from the Gulf Coast alone amounts to about 1,200,000 barrels per day, and requires the services of a fleet of 260 domestic tankers. This large tanker fleet normally has some excess capacity, but a combination of circumstances has resulted in a rather tight situation at present.

These circumstances are, first, the fact that a large percentage of our tanker fleet was built during and shortly after the last war, and hence is nearing the end of its useful life; second, during the past two years a considerable number of ships has been transferred into foreign service to replace ships which have been sunk and to make up for the longer hauls and less efficient use of tankers brought about by war conditions. In addition to this, eight large, high-speed tankers have already been requisitioned by the Navy and several more are likely to be so requisitioned, especially in the event of war. As a result, there has been some shortage in tankers during each of the last two winters when the peak demand for heating oils tends to create a shortage.

Southeast Pipeline

In the event of a naval war in the Atlantic, which might result in the loss of some tankers and necessitate the use of a convoy system, there would undoubtedly be serious difficulty in supplying civilian requirements on the East Coast and for this reason we have been urging the industry to relieve this situation by all possible means. Such means include the building of more storage on the Atlantic Seaboard, so that reserve stocks can be built up and tankers can be used effectively during the slack season; the building of more tankers, 25 of which are expected to be delivered during this calender year, and the building of any pipe line or barge transportation facilities which can be undertaken by private capital to help to supply the East Coast without involving the tanker haul around Florida. Unfortunately, to get deliveries of additional tankers ordered now would require at least two years on account of the large amount of naval and other ship construction which is ahead of any new orders.

Aviation Fuel—There are, of course, certain special products for which the percentage increase in demand is considerably higher than I have mentioned for the major products. Outstanding among these is 100 octane gasoline, a synthetic product which was only a laboratory curiosity a few years ago. 100 octane gasoline is of inestimable value in the design and operation of military aircraft—it permits a properly supercharged engine to deliver at least 20% more power than it can deliver on 90 octane gasoline, which is the best quality available to the Axis powers.

In spite of the fact that the construction of synthetic plants for the production of 100 octane gasoline has been quite expensive, the oil industry already has constructed enough capacity to meet more than twice the present domestic and foreign demand. Indeed, at our urging, but without any Governmental assistance, the industry has been continuing to increase its facilities and build up substantial stocks on its own account, so that estimated requirements for at least the next fifteen months can be met without further construction than that already announced. In addition to this we have recommended that the Army and Navy take advantage of present industry capacity to build up substantial reserve stocks of their own.

Suggests Storage For Navy Stocks

The Petroleum Unit has also recommended that the Navy build up substantial reserve stocks of heavy fuel oil, particularly on the East Coast, where there is much less fuel oil available for emergency needs than there is on the Pacific Coast. We have recommended that most of these reserve stocks of both Navy Fuel Oil and Aviation Gasoline be stored underground and have suggested detailed designs for such storage facilities.

The petroleum industry has been, and in my opinion will continue to be, able to supply every foreseeable demand for petroleum and its products without requiring any Government funds or advance Government contracts. Of course, this statement does not necessarily apply to new construction required to help meet shortages in other industries, such as the production of synthetic toluene

(*Continued on page* 22)

THE EDITOR'S PAGE

Readers Comments and Opinions will be much Appreciated by—WARREN C. PLATT, Editor and Publisher. Penton Building, Cleveland, O.

Radical Change in Middle West Marketing Probable from latest I.C.C. Rate Decision

The victory of the Petroleum Rail Shippers Assn., when the Interstate Commerce Commission last week decided that both rail and gasoline pipe line rates from the Mid-Continent territory had to be materially reduced, is a momentous one.

It undoubtedly will have a far reaching influence on the marketing and refining set-up of the whole oil industry, for it probably is the start of getting railroad rates down to a competitive basis with other forms of oil transportation and this decision also marks the end of high rates on pipelines.

It has been a score or more of years since there has been a similar large rate victory by Independent refiners. Up to the last war and a bit beyond, the National Petroleum Assn. with a few thousand rate complaints battled down the rail rates especially from Mid-Continent refining points to the North and East which permitted Independent refiners to come into existence and brought into life the jobbers out over the Mid-Western marketing territory. Those old rate battles made what is now the Independent oil industry between the Appalachians and the Rockies. A part of this battle for open transportation was the investigation by the I.C.C. which wound up with the approval of the U.S. Supreme Court making pipelines common carriers in law.

Following this period of transportation warfare, both the large and the small refiners and the jobbers seemed to be agreeable to going along "as is" even though the rails advanced their rates a number of times. And no one, neither refiner nor jobber, ever made the slightest move to avail himself of the National Petroleum Assn.'s big victory in establishing pipelines as common carriers.

But the big development of water transportation up the Mississippi, Missouri and Ohio river valleys, and on the lakes, and the development of pipelines, particularly for gasoline, created advantages in dollars over the Independent refiners who still stayed in the producing fields, that bit by bit were given away. This narrowed margins and the introduction of nationally advertised brands of gasoline, forced the jobbers away from the Independent refiners. These latter had to shrink their territory steadily until the last few years but a very small per cent, even as low as 5% of the output of the rail shipping Independent Mid-Continent refiners, went outside of their home state or more than a couple of hundred miles away.

This last decision of the I.C.C. will open up this western territory more for these Mid-Continent refiners. How much more territory they will have will depend upon just what rate reductions the rails put into effect and particularly on how far the railroads go in adopting the recommendations of the majority of the Commission for train load rates.

As more oil marketers have been developing their own brands of gasoline and selling those brands generally at a price differential, this decision will open up more sources of supply to them. However, major companies have been letting down the bars against these independent sellers and selling them gasoline in recent years. With lower rates from the Independent refiners it probably can be expected that these private brand operators will be able to get more supplies at a competitive price and if so, their continued growth probably can be expected.

Private brand operations have been growing far more rapidly in some of these Western states than have major company brands. In Wisconsin in the six years from 1933 to 1939, private brands, according to a careful check of the gasoline tax reports, increased 147.2% against an increase of 38.6% in all gasoline sales; and roughly 85% of sales the country over are of nationally advertised brands. In Iowa, the private brand increase has been 136.9% against the total state increase of 55.6%. In Kansas, private brands have gone up 61.9% against the total increase of 25.5%.

The Commission's decision calls for lower rates into Illinois and Indiana where for some years now private brands have been making good headway and where they have been marketed from some of the best looking stations and with excellent sales plans. In Illinois these six years, private brands have increased 92.6% against all gasoline there of 36.7%, and in Indiana the private brands have gone up 83.5% against an increase of 50.9% for the state.

As a jobber handling a major company brand of gasoline cannot substitute some one else's gasoline for the major's gasoline, it would appear that the additional gallonage that the Mid-Continent refiners may be able to ship under the new rail rates must go to the private brand sellers. This means that they will have the additional supplies that should permit them to take "their share" of the extra increase in gasoline consumption due to the war defense effort, and if the new supplies are sufficient, go after more of the gallonage that heretofore has gone to the national brands.

The extent to which Independent refiners may use the gasoline pipelines under the Commission's decision is problematical. Pipeline transportation for an Independent refiner is not the simple thing that some critics of the lines seem to think it is. There is the cost of hooking up with the line, of accumulating enough of one grade for shipment at one time to one destination, regardless of whether the shipping restrictions are 5000 bbls. or 100,000 bbls., and then the problem of providing storage and distributing from the far end of the pipeline. Pipelines have a competitive advantage but it is not an advantage that can be easily or cheaply realized on by the Independent refiner no matter what the I.C.C. may do about it.

If the railroads proceed with much lower rates and especially to train load rates as some have planned, it is entirely probable that not a barrel of gasoline will be shipped in any one's pipeline by Independent refiners. The rail shipment would be cheap enough and far more convenient for the refiner and for his jobber already on the railroad.

At all events, there can be no question but an observer is well warranted in the conclusion that this Interstate Commerce Commission decision will undoubtedly greatly change the oil map of the middle west for the next 5 to 10 years.

Greater Barge Development Predicted

Here is an observation on the war future on barge and truck transportation of interest to every man in oil marketing—

> "Increased inland waterway transportation combined in some cases with a wider radius of truck distribution, may be substituted for some of the tanker movements. Barge construction requires less time and less extensive building facilities than in the case of tankers."

That is the statement of Eugene Holman, director in charge of tanker transportation of the Standard of New Jersey in an address last month before the American Mining and Metallurgical Engineers at New York. He was listing what the oil industry might do to lessen the demand for tankers. Because of war losses, demands of the British and American navies has exceeded the supply.

Oil marketers are still pushing the use of inland waterways for the hauling of petroleum products but, in the opinion of this expert, we may look for still greater development. These lower hauling costs will continue, undoubtedly to be reflected in the price the consumer pays, regardless of the new barge user's determination to keep the saving for himself. Then competitors wonder what is the matter with the price structure?

K. R. Proctor, L. S. Peirce Elected Vice-Presidents of National Refining

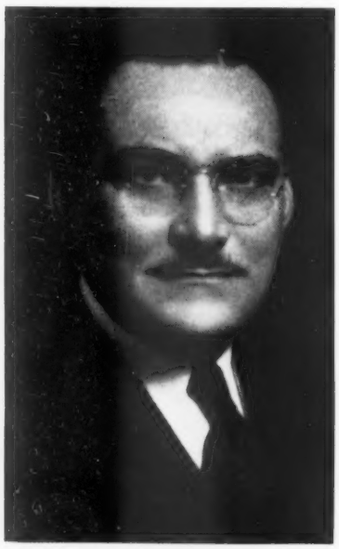
N. P. N. News Bureau

CLEVELAND, March 29.—K. R. Proctor and Louis S. Peirce, both of Cleveland, have been elected vice-presidents of The National Refining Co., according to an announcement this week, following the annual meeting of shareholders.

Board of directors was reduced from 10 to 9. The vacancy created by the resignation of C. S. Smith, last summer, was not filled. Remaining 8 directors elected last year were re-elected. They are:

Oscar L. Cox, Cyrus S. Eaton, I. F. Freiberger, E. B. Greene, W. H. Lamprecht, 2nd, Robert C. Norton, Walker H. Nye, and Paul Ryan.

Mr. Ryan, president of National, is still confined to St. Alexis Hospital, Cleveland, and thus was unable to attend the meeting. Mr. Ryan was seriously injured in a plane crash, Dec. 4, 1940, near the Chicago airport.



K. R. Proctor

L. S. Peirce

Mr. Proctor, 41, commenced working for National as a city salesman in Indianapolis in 1922. Moving up to bulk plant manager and then division manager, he was transferred to Cleveland in 1937 to assist the manager of divisions and later was made merchandising manager. He is now vice-president in charge of sales.

Mr. Peirce, 33, fills the vacancy resulting from the recent resignation of Irving C. Bolton. Mr. Peirce joined National last year as secretary and general counsel. Following his graduation from Harvard, he worked with a law firm for 7 years and later was head attorney for Securities and Exchange Commission. He is a trustee of the Y. M. C. A. and Legal Aid Society, as well as being a director of the Humane Society.

Canada Lube Imports Are Not Restricted

Special to N. P. N.

TORONTO, March 29.—All applications for permits to import lubricating oil into Canada have been granted, to date, George R. Cottrelle, Oil Controller for Canada, told NATIONAL PETROLEUM NEWS, late this week.

How soon any measure of control in this regard or in the sale of gasoline would be exercised, he said no one knew but added that his office was getting ready by gathering statistics and other information about the oil industry.

One of the largest importers of lubricants was also preparing for any eventuality by building a refinery on the outskirts of Toronto for refining lubricating oils. "No one can say whether or when further measures of control may be necessary", said Mr. Cottrelle. "Hitler maps our course. We can't chart our own way in this matter."

Referring to Turner Valley, Mr. Cottrelle said that, while last year there was not enough storage capacity for crude to permit equalizing the peaks and valleys of demand, there was at the moment more storage than the producing wells could utilize. Turner Valley allowable for March is 26,000 bbls.

Mr. Cottrelle stated that when he became Oil Controller, he thought his work was to mobilize the industry for war purposes and didn't expect to have anything to do with marketing, but he found that conditions were such that the latter could not be ignored. A recent order in council enables him to fix maximum prices and to appoint deputies throughout Canada.

Ohio Standard Hikes 'Gas' .05c

CLEVELAND, April 1. — Standard Oil Co. of Ohio has announced an advance in its gasoline prices, effective April 2, which, the company states, effects "almost entirely a restoration of 0.5c per gal. in tank wagon and service station prices in most of the depressed areas in the State."

A 0.5c advance to 11c, ex taxes, in its "statewide" consumer tank wagon price for X-70 gasoline (regular) also will be posted April 2, but the "statewide" structure to resellers and at service stations will remain unchanged, a company official said. Consumer Q.D.A. schedules will remain in present brackets with the 0.5c advance in consumer tank wagon price, he added.

Standard's reseller and retail prices throughout the state have for some time been under the company's so-called "statewide" structure of 9c reseller, and 12.5c retail, ex taxes, and all points in the state will still be under the "statewide" structure following the April 2nd advance Standard reported.

"The April 2nd advance will bring prices to a maximum of 8.5c to resellers and 11.5c retail, at any point in the state," he added.

Prices which the Standard will post April 2 for Sohio X-70 at principal points in the state, all of which are up 0.5c over current postings, except Marietta up 0.25c to resellers and 0.5c retail, are shown below: (Prices are ex 5.5c taxes; prices to "resellers" do not include "authorized agents"; retail prices are at company-operated stations)

	Consumer T.W.	Resellers	Retail
Statewide	11.0c	*9.0c	*12.5c
Akron	11.0	8.0	10.0
Cincinnati	11.0	8.0	10.5
Cleveland	11.0	8.5	11.5
Columbus	11.0	8.5	11.5
Dayton	11.0	7.5	10.0
Marietta	11.0	8.25	11.0
Toledo	11.0	8.0	10.5
Youngstown	11.0	8.5	11.5

*Unchanged.

(See page 20 for other price changes.)

Quaker State Explosion Causes $100,000 Damage

By Telephone

EMLENTON, April 1.—Damage estimated "well beyond $100,000" was caused by an explosion and fire at Quaker State Oil Refining Corp.'s Emlenton, Pa., plant, March 30, General Manager Guy Hunter told NATIONAL PETROLEUM NEWS today.

Skehan Is Promoted By Jersey Standard

J. E. Skehan

NEW YORK, March 31. — John E. Skehan, associated with the Standard Oil Co. of New Jersey for the past 30 years, has been named a vice-president and manager of all domestic sales of the company and its affiliated Esso Marketers, Jersey Standard announces. Mr. Skehan will work under Robert T. Haslam who continues as vice-president and general sales manager.

Mr. Skehan joined the company, which is a domestic operating subsidiary of the Standard Oil Co. (N. J.), in Newark as a clerk back in 1902. In 1926, he became manager of sales for New Jersey. He went to New Orleans as vice-president and general manager of the Standard Oil Co. of Louisiana in 1931, returning to New York in 1933 as wholesale manager for the Esso Marketers.

He was made southern domestic sales division manager in 1936 and remained in that position until taking charge of all divisions this month. He is a resident of Montclair, N. J.

James D. Berry Dies

James D. Berry, 62, president of James B. Berry Sons' Co. and vice-president of Quaker State Oil Refining Corp., died April 1 after a long illness.

Mr. Berry was one of two sons of James B. Berry, pioneer Pennsylvania oil man. James D. started in the oil business with his father, who was then doing business under his name of James B. Berry. In 1898, young Mr. Berry went with Standard Oil Co. of Kentucky at Louisville. He returned to Oil City and re-joined his father in 1900, and when his father died in 1908, he and his brother, Charles D. Berry, formed the James B. Berry Sons' Co. James B. Berry Sons' Co. became affiliated with Quaker State in 1933.

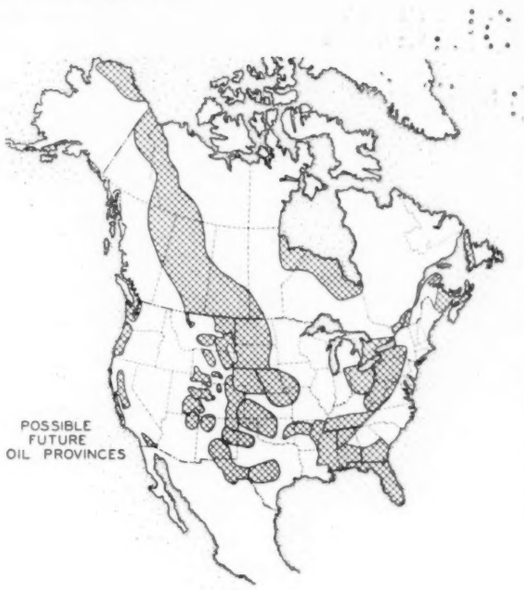
Mr. Berry leaves a wife and a son, also named James D.

New Oil Reserves North of Rio Grande Charted by Petroleum Geologists

HOUSTON, April 1. — Convinced it is wise to take a look at the oil industry's "hole card" and re-examine its thinking regarding the nature and quality of future oil supplies, geologists at the annual meeting here early this week of the American Assn. of Petroleum Geologists took the first step in a new inventory of what the industry has in the way of petroleum reserves out in its warehouse.

Tentatively, the geologists spotted "possible future oil provinces north of the Rio Grande" on their master map, backed up their contentions on each possible province with individual maps showing detailed location and other pertinent geological data and then asked for the ideas of each geologist present.

"We who are geologists are the only group within the industry who have any business talking about undiscovered reserves, whether it is much or little, where it may occur, or how it will be discovered," A. I. Levorsen of Tulsa, who led the symposium on reserves, announced.



Dark portions in above map indicate possible future oil provinces, according to findings of the American Assn. of Petroleum Geologists. In the Pacific Coast area, geologists state that "most favorable area" is Oregon

May Need New Reserves

It is conceivable that the oil industry may be called upon at any time to discover large quantities of new oil, whether immediately or over the decades to come, it was said. The crux in the reserve question from a national and industry viewpoint, according to Mr. Levorsen, is in undiscovered reserves with which to replace the industry's present reserves of some 18 to 20 billion bbls., now considered "adequate."

So, with this in mind, participating geologists representing sectional societies, the industry and research groups started this survey of the possible petroleum reserve areas on the American Continent north of the Rio Grande.

Criteria used in plotting future provinces included (1) the presence and volume of sediment underlying the area, since "in the proportion to the amount of sediment present is the chance of producing oil", (2) the evidence of oil and gas as indicated by drilling, oil seeps, tar sands, "mud smells", etc.; (3) the presence of unconformities and (4) the known existence of regional wedge belts of porosity.

In discussing the best criteria in spotting "possible" oil reserves, Mr. Levorsen said that "if we did not think a certain kind of data was significant, it would not be included in our inventory."

Known Sections Eliminated

Not considered in the survey are those areas having known sedimentary section of less than 1000 ft., those areas in which favorable factors extended below the 15,000 ft. mark, which now represents the "maximum economic drilling depth;" and those unexplored areas within a present known oil province.

The largest single province charted by the geologists extends from the northern part of Canada, angles down through the western Canadian provinces and extends downward into the U. S. The area covers approximately 650,000 square miles, is underlain by 1000 to 13,000 ft. of sedimentary rock, with estimated gross volume of 650,000 cu. miles of sediment. The area is characterized by some unconformities and evidences of oil and gas, it is reported.

Considering this area in the light of statements made at the symposium, that "in proportion to the amount of sediment is the chance of producing oil," then this province represents the largest possible oil province in Canada, with the Hudson and James Bays region running second place.

Oil Reserves in U. S.

In the U. S., large possible oil provinces extend from Canada down well into the tier of the West-Central states. The North and South Dakota — eastern province—has a gross volume of 125,000 cu. miles of sediment, with known regional unconformities and indications of several large wedge belts of porosity extending throughout much of the area's length. Evidences of oil and gas are to be found, with development of the area retarded by distance from large markets.

In this same general area, the following areas are listed as possible future oil provinces: western Nebraska, considered favorable due to the combination of uplift, erosion and overlapping deposition; the Salina and Forest City Basins of Kansas, Nebraska, Iowa and Missouri, a province of 60,000 square miles featured by an average thickness of 3000 ft. of sedimentation, large unconformities, possible porosity wedges and opportunity for sand lenses or shoe-string type oil accumulations; Anadarko-Panhandle Region of Oklahoma, Kansas, Texas and Colorado, covering 140,000 square miles and containing 3 important unconformities, more than 1000 linear miles of sedimentary wedges of porosity, additional wedges and presence of oil; southeastern Oklahoma and northwestern Arkansas, with sedimentation ranging from 3000 to 15,000 ft. deep under its 12,500 square miles of area accompanied by unconformities.

Areas in Texas

Listed as possibilities in the West Texas area is the 40,000 square miles of area in the so-called "North Llano Estacado" area, with a 10,000-ft. thick sediment and total volume of 76,000 cubic miles, together with possibilities of varied and numerous unconformities; the Edwards Plateau, consisting of 15,700 square miles of possible reserves underlain by 1000 to 12,000 ft. of sediment estimated as 26,000 cubic miles; the Trans-Pecos Province in West Texas and Southeast New Mexico, covering 45,000 square miles and with gross volume of 75,000 cubic miles of sediment.

Judging from the sediment indicated by the survey, southeastern states may have oil to fall back on as a natural resource in the future. Florida has 128,000 cubic miles of sedimentary formation with significant unconformities and indications of gas to back up the geologist's contention this is a future oil source. Northwest Alabama with its "marked unconformities" and Mississippi with its combined sediment of 140,000 cubic miles, together with large and small regional unconformities, are listed as possible producing areas in addition to southern Alabama, Georgia and Tennessee.

Appalachian Reserves

The 520 by 320 mile area in the Appalachian basin that extends from eastern Kentucky into southern New York is another potential oil reserve, according to the symposium. This area contains 210,000 cubic miles of sediment. Mentioned as possible oil province is the so-called "North Cincinnati Arch area."

In the Pacific Coast states, the "most favorable area" for future exploration in Oregon are the anticlines in the coast range and possible buried structures in the valleys between the coast and Cascade Ranges, but the report lists some "unfavorable factors." Western Washington presents some oil possibilities as indicated by small-time production of high gravity crude on the Hoh River and the presence of what the Indians call "smell muds."

The "California Coastal Embayments" area, with numerous oil seeps and tar sands scattered within its 3200 square mile area has facies changes within the sedimentary rock that indicate possibility of the presence of oil.

New California Reserves

The Sacramento Basin of California has oil potentialities, according to the geologists, as indicated by the thickness of the sediment, oil seeps and the presence of unconformities. The area covers 22,000 square miles. Evidence of intense deformation in the Imperial Valley of California makes this area another "possible."

In addition to Canada's big possible oil province, the reports mention other and smaller provinces in eastern and central Ontario, the Ontario penin-

sula, Nova Scotia, New Brunswick, Prince Edward and Magdalen Islands and 2 areas in Quebec. Northern Alaska is also listed as a possible future province.

In addition to the above areas, there are numerous other sections within the present provinces of known reserves yet to be discoverec, Mr. Levorsen said.

Vast Canadian Reserves Cited by Max Ball

Special to N. P. N.

MONTREAL, March 29.—Max Ball, president of Abasand Oils, Ltd., Edmonton, Alberta, told the Canadian Mining Institute in session here that Canada possesses the greatest oil reserve in the world in the tar sands of the Athabasca region. These tar sands, he said, "contain several times as much oil as all the other proved reserves of the world".

Estimates of the minimum content of the Northern Alberta deposits vary from 100 billion barrels to 250 billion barrels, he said. Exploration, he said, must wait on the northern penetration of industry, although a marked stimulus in the past few years was producing results.

Mr. Ball is author of the recent "best seller", "This Fascinating Oil Business" which was reviewed by NATIONAL PETROLEUM NEWS, April 17, 1940, p. 44.

Petroleum Chemists Plan April Meeting

N. P. N. News Bureau

CLEVELAND, March 31.—Division of Petroleum Chemistry, American Chemical Society, is sponsoring a two-day symposium on "Anylytical Methods Used in the Petroleum Industry" at the society's annual meeting in St. Louis, April 7-11.

Nineteen research reports will be presented on such subjects as new designs of a fractionating column, an instrument to measure the viscosity of opaque liquids, and a filtration cylinder will be described, together with modifications of accepted analytical techniques.

Dr. J. K. Roberts, Standard Oil Co. (Ind.), chairman of the division, will preside. Programs are already in the hands of the 700 members of the petroleum division. Over 50 oil technologists have had a part in the preparation of 29 papers to be delivered.

Effect of World Affairs on Petroleum To Be Discussed at April WPRA Meeting

N. P N. News Bureau

TULSA, April 1.—Discussions of national and international affairs as they effect the oil industry are scheduled on the general program of the 29th annual meeting of the Western Petroleum Refiners Assn., April 16-18 at Hot Springs, Ark.

Col. Willard Chevalier of New York City, publisher of Business Week and former army engineer in the A. E. F., will speak April 17 on "Business Under Arms."

In addition to reports on association activities, R. W. McDowell of Tulsa, vice-president of Mid-Continent Petroleum Corp., will review the petroleum industry since 1939.

"The Automobile—Is it Lipstick or Lifeblood in Our Defense Economy?" is the subject of the talk to be presented at the April 18 general session by Paul G. Hoffman of South Bend, Ind., president of Studebaker Corp.

The relation of petroleum and other industrial materials to political and strategic factors in the national and international picture will be discussed by Henry M. Busch of Cleveland, Western Reserve University. A student of international affairs and a world wide traveler, his subject will be "America in a World at War."

The program has been arranged so that mornings will be given over to technical subjects, the afternoons to general sessions, and evenings to entertainment features.

Discussion of modern trends in lubrication and the by-products of petroleum will feature the technical sessions. (See March 19, NPN, p. 19 for detailed report on technical program.)

Wilmer Schuh Issues Statement to NPN On Being Expelled From Head of NAPR

N. P. N. News Bureau

CLEVELAND, March 31.—Wilmer R. Schuh, former president of National Assn. of Petroleum Retailers, has been expelled by the board of directors, according to an announcement signed by Fred Brewer, Mel Holland, Carl Johnson, W. M. Boutin and Bradley Provis.

Mr. Schuh, in a statement to NATIONAL PETROLEUM NEWS, said he regretted the board's "hasty action" but bore "no malice toward anyone." Text of Mr. Schuh's statement is published here.

Complete press release from N. A. P. R. follows:

Statement from NAPR

"The Executive Committee of the National Association of Petroleum Retailers has voted unanimously to expel Wilmer R. Schuh, former President, from his Directorship in the organization, it was announced here this week in a statement signed by the executive committee. Schuh was accused of 'conduct and acts' which were prejudicial to the interests of the NAPR in the suit, "E. Chat Shanks vs the NAPR." In this action Shanks sued the NAPR for over $6000, which he claimed was due him for expenses advanced and for salary in his former capacity as Executive Secretary of the Association. Schuh was accused by the Executive Committee of having withheld in his personal possession, books and records of the NAPR, which present officers did not know existed until the time of the trial. They were introduced as evidence, it was said.

"The Executive Committee's statement signed by Fred Brewer, Mel Holland, Carl Johnson, W. M. Boutin, and Bradley Provis was as follows:

'On December 9th, 1940, a resolution was passed by the Executive Committee of the NAPR, condemning the conduct and actions of Wilmer R. Schuh, which were considered prejudicial to the interests of the NAPR in the suit "E. Chat Shanks vs NAPR."

"At the same time the Executive Committee requested from Wilmer R. Schuh his resignation "E. Chat Shanks vs NAPR."

"This request for his resignation has been ignored by Schuh. Therefore, the Executive Committee of the NAPR, meeting in Chicago, Ill., on Tuesday, February 18th, 1941, voted unanimously to expel Wilmer R. Schuh from his Directorship in the NAPR, effective immediately.

"Further facts: Shanks tried to tie up all of the Association's funds by garnishment, but the same were released by Court Order. A general denial of the claim has been filed and the suit is now pending trial on the issues."

Schuh's Statement

Complete text to Mr. Schuh's statement to NPN follows:

"I sincerely regret the hasty action taken by the Executive Committee of the NAPR and I have serious doubts as to its legality. It is difficult to understand the committee's reluctance to afford me an opportunity to present the facts of the matter to a full meeting of the Board of Directors. Certainly, the decent and democratic way would have been to have afforded me a fair trial.

"At a meeting of the Board of Directors in Des Moines, Iowa, September 1939, it was voted to liquidate certain obligations, the funds for which I was instrumental in raising. The present administration has failed to carry out this order of the Directorate and the only complaint against me which is justified is that I have insisted that these obligations be paid.

"I bear no malice toward anyone and I have enjoyed working with the many fine men who have served on the NAPR Board and I still number most of them among my friends."

A. C. Galbraith Resigns From Union Oil Company

N. P. N. News Bureau

LOS ANGELES, March 29.—A. C. Galbraith, vice-president of Union Oil Co. and for many years in charge of its personnel and industrial relations programs, has resigned to enter private practice as a councillor in personnel-management relations.

Station Attendants' Training Course Postponed by Indiana Oil Marketers

INDIANAPOLIS, March 27.—Because many Indiana oil marketers would be unable to attend the state-wide service station training program, inaugurated by Indiana Independent Petroleum Assn., and scheduled for March 31 to April 2, arrangements have been postponed, George H. Lilly, Hoosier Petroleum Co. and chairman of education advisory committee, announced today.

In outlining this training program to NATIONAL PETROLEUM NEWS, George W. Hofmayer, I. I. P. A. secretary said:

"The instructional material being developed is on a careful analysis of the work of successful service attendants (salesmen). This analysis reveals in detail (1) what the attendant must be able to do, or the duties making up his job; (2) what the attendant must be able to do, to perform each duty or task most effectively; (3) the typical situations the attendant must meet successfully through a combination of skill, knowledge and judgment. The instructional material is being prepared in the form of discussion leaders' outlines, which will be made available through the association."

Indiana University is co-operating in the development of this special course in service station instruction.

WITH THE ASSOCIATIONS

Correa again Heads New York Oil Trade

W. H. Correa

NEW YORK, March 31.—At the annual meeting of the Oil Trades Assn. of New York on March 25, William H. Correa, New York, Socony-Vacuum Oil Co., Inc., was re-elected president of the association for the coming year. Mr. Correa, former chairman of American Petroleum Institute's Lubrication Committee, is also a vice-president of Socony-Vacuum Oil Co. of Canada, Ltd.

Other officers elected with Mr. Correa were: W. M. Osborne, Zimmerman, Alderson, Carr Co., vice-president; Joseph C. Smith, Smith-Weihman, Inc., secretary; and Rudolf G. Sonneborn, L. Sonneborn Sons, Inc., treasurer.

Over 250 members of the oil industry in New York attended the annual meeting and banquet held in the Starlight Roof of the Waldorf-Astoria Hotel. The gathering indorsed the following men for the board of directors:

John W. Baker, Philippine Refining Corp. of New York; J. H. Blakney, Colgate-Palmolive-Peet; W. Chalmers Burns, Richfield Oil Corp.; William H. Correa; Charles V. Bacon; Dartley E. Hoffman, Tide Water Oil Co.; W. M. Osborne; John F. Renick, Renick and Mahoney; Joseph C. Smith; Rudolf G. Sonneborn; and Albert J. Squier, Squier and Sanderson. Two new names appeared among the old as Gordon L. Benjamin, Gulf Oil Corp., and Leonard C. Quackenbush, Alliance Oil, joined the board as new directors.

Oil Safety Meeting Planned For April

N. P. N. News Bureau

NEW YORK, March 31. — How to prevent accidents and assure safe storage of oil will be topics under discussion here at the sessions on petroleum and national defense during the 12th Annual Safety Convention and Exposition at Hotel Pennsylvania, April 22-25.

This convention is under the auspices of the Greater New York Safety Council and will be conducted by the Atlantic Division, National Safety Council. The central theme is "Safety-Defense-Liberty."

Oil Session Speakers

R. W. Black, vice-chairman and secretary, Northeastern Committee on Safeguarding Oil Storage, American Petroleum Institute, will speak on the protection of oil storage in the national defense program. Charles A. Miller, chairman, Petroleum Section, National Safety Council, is expected to address the session on the preservation of man power in defense industries. The third speaker will be J. L. Risinger, Safety Supervisor, Socony-Vacuum Oil Co. who has chosen his subject on anticipating oil companies' personnel safety under the defense program. A. H. Vineyard, Shell Oil Co., Inc. will preside at these sessions.

N.G.A.A. Schedules Research Projects To Be Discussed at Annual Convention

N. P. N. News Bureau

TULSA, March 29.—Twentieth annual convention of the Natural Gasoline Assn. of America this year features the results of research projects sponsored by N. G. A. A., according to announcement today.

Breaking the old custom of holding its annual meetings in Tulsa, N. G. A. A.'s meeting this year will be staged at Dallas April 23-25.

Introduction of a new charcoal method for determining the gasoline content of natural gas, new volume correction factors for liquefied petroleum gases and new light on the variables in Reid vapor pressure determinations will be discussed, N. G. A. A. reports.

One research project of the association's technical committee, concerned with possible standardization of apparatus and procedure in low temperature fractional distillation, will be given its first public presentation in a paper by C. E. Wharton and H. A. Montgomery of Gladewater, Tex., Hanlon-Buchanan, Inc.

A high pressure gas session will attract the attention of engineers engaged in repressuring, pressure maintenance and recycling operations, the announcement says. A paper on "Dehydration in High Pressure Gas Operations," by R. A. Carter of Ponca City, Continental Oil Co., will be followed by a prepared discussion by Dr. G. G. Brown and Dr. Donald Katz of Ann Arbor, University of Michigan.

"Close Fractionation in the Manufacture of Special Products at Natural Gasoline Plants" is the subject of a paper to be presented by H. W. Harts of Tulsa, vice-president of Warren Petroleum Co. Following the paper, J. L. Gallagher of Tulsa, Sinclair-Prairie Oil Co., will lead a discussion on the subject.

Opening the session will be the annual President's address by George P. Bunn of Bartlesville, Phillips Petroleum Co. "Natural Gas and Gasoline in National Defense" will be discussed by Elmer Schmidt of Dallas, vice-president of the Lone Star Gas Co.

A non-technical summary of processes by which a growing number of valuable synthetic products may be made from individual hydrocarbons in natural gas will be given by Dr. F. H. Dotterweich of Kingsville, Tex., Texas A. & I. College.

Additional Papers

Other scheduled papers listed are the ones on "Safety in Handling, Shipping and Marketing of Liquefied Petroleum Gas," by G. L. Brennan, Philgas Division of Phillips Petroleum Co., and "Compressor Losses Caused by Orifice Meters" by V. E. Middlebrook and Jed Burnham, Shell Oil Co., Inc.

The closing day of the convention wil be given over to the "Operating Kinks· Sessions," field day for field, plant and laboratory men to present their original ideas for doing any job within their province in a safer, quicker or cheaper way.

T. R. Goebel of Houston, Shell Oil Co., Inc., is chairman of the program committee.

Los Angeles Oil Men Organize New Group

N. P. N. News Bureau

LOS ANGELES, March 29.—Subjects of common interest to California oil men are to be discussed informally at luncheon meetings of the Petroleum Forum, a new organization recently formed here under the leadership of A. E. Bell, Jr., of A. E. Bell Corp. Purpose of the new group is to provide an opportunity to consider the problems of the oil industry from different points of view and to promote a better understanding of those problems.

Activities of the Forum will be determined by membership representatives of the various sections of the industry and will be independent of other trade organizations.

Officers are: H. B. Duchand, Republic Petroleum Co., president; J. K. Wootan, Sunset Oil Co.; R. A. Broomfield, Jr., Barnsdall Oil Co., and G. S. Follansbee, Jr., Universal Oil Co., vice-presidents; W. A. Weiss, Lloyd Corp., Ltd., recording secretary; D. P. Murdy, Wilshire Oil Co., corresponding secretary; and A. E. Bell, Jr., treasurer.

Crude Prices Hiked In Midwestern Area

(*Continued from page* 11)

crudes were increased 7c, and all Panhandle crude was placed on the West Texas-New Mexico schedule, which has the effect of increasing crude purchased in Gray and Wheeler Counties 6c, and in Carson and Hutchinson Counties 11c.

Hawkins crude (Wood County, Tex.), a new posting by Humble, ranges from $0.73 for below 20 gravity oil up to $0.85 for 25 gravity and above.

East Texas and Van crudes increased 5c; Conroe 6c; Yates (Pecos) and Talco 7c; Salt Flat 8c.

Tomball, formerly on gravity schedule with prices ranging from $0.95 to $1.31, was posted at a flat price of $1.30 per bbl.

Humble's new schedules are shown on Page 61 of this issue of NPN.

TULSA, April 1.—Standard Oil Co. of Indiana and its subsidiary Stanolind Oil Purchasing Co. today announced a 5c per bbl. increase in their crude price schedules in Oklahoma, Kansas and North Texas, effective April 1. Company's new prices in Oklahoma and Kansas range from $0.75 for below 21 gravity oil up to $1.15 per bbl. for 40 gravity and above, with 36 gravity posted at $1.07.

In North Texas, the Stanolind's new prices range from $0.68 for below 21 gravity up to $1.08 for 40 and above.

TULSA, April 1.—Carter Oil Co. (Standard of New Jersey subsidiary) today advanced prices it will pay for Oklahoma crude 5c per bbl., with below 21 gravity posted at $0.65 per bbl. and prices ranging up to $1.15 for 40 gravity and above.

Carter also announced a 5c increase to $1.20 per bbl. in its price for Loudon, Ill., oil.

Gulf Advances Crudes

TULSA, April 1.—Gulf Oil Corp. today advanced its Oklahoma and Kansas crude prices 5c per bbl., and New Mexico posting 7c, meeting Humble's advance in New Mexico, according to a company announcement.

CLEVELAND—Increases of 5c to 10c per bbl. in posted prices for Kentucky and Ohio crudes have been announced by Standard Oil Co. of Ohio and subsidiary companies as follows: Western Kentucky, up 5c to $1.15 per bbl.; Lima, O., up 5c to $1.05 per bbl.; Cleveland, Lodi and Chatham, O., areas, up 10c to $1.10 per bbl. All increases are effective April 1.

TULSA, April 1.—American Liberty Pipe Line Co. has reported advancing price it will pay for the approximately 10,000 bbls. of East Texas crude it buys daily, 5c to $1.15 per bbl.

Phillips Petroleum Co. has announced a 6 to 11c per bbl. advance in its crude prices in the Texas Panhandle, posting same prices as Humble in that area.

Conoco Hikes Gasoline

PONCA CITY, Okla., April 1—Continental Oil Co. announces that, effective April 1, it advanced its tank wagon gasoline prices 0.5c generally throughout Oklahoma.

Socony Ups Gasoline In Metropolitan New York

NEW YORK, April 1.—Socony-Vacuum Oil Co., Inc. will advance its undivided dealer prices for Mobilgas (regular) 0.4c per gal. in Manhattan, Brooklyn, Queens, and the Bronx, effective April 2, according to a company announcement today.

Oklahoma Tank Wagon Prices Advanced 0.5c by Magnolia

N. P. N. News Bureau

TULSA, April 1.—Tank wagon gasoline prices were advanced 0.5c a gal. effective April 1 by Magnolia Petroleum Co. at most Oklahoma points, making two southwestern states in which tank wagon prices have advanced recently. Texas tank wagon prices were increased 0.5 to 1c a gal. March 18.

Advances of 0.5c were announced at all Oklahoma points where premium grade gasoline was 14c or less, where regular grade was 12.5c or less, where third grade was 11.5c or less and kerosine 6.5c or less. Gasoline prices include tax.

Exceptions to the price advance were Oklahoma City and Tulsa.

Ohio Standard Advances Kerosine T. C. Price

CLEVELAND, April 1.—Standard Oil Co. of Ohio today announced 0.125c increase, effective April 2, in its tank car price for kerosine, to 5.875c per gal., ex tax, delivered anywhere in Ohio.

Jersey Standard Advances New Jersey Kerosine

N. P. N. News Bureau

NEW YORK, March 29.—Standard Oil Co. of New Jersey advanced its dealer tank wagon price for "Esso" kerosine in New Jersey, 0.2c per gal. to 7.40c, effective March 27, according to a company announcement. An advance of 0.2c per gal. in tank wagon fuel oil prices (Nos. 1, 2, and 3) in New Jersey was also announced as effective the same date.

2 Different Crude Schedules Posted in California Fields

N. P. N. News Bureau

LOS ANGELES, March 29.—Two widely differing crude price schedules are now posted in California fields. Standard Oil Co. of California's schedule, posted March 12, adjusted prices in only the San Joaquin Valley and Elwood fields, making no change in any of the Basin fields.

However, when Union Oil Co. of California posted its revised schedule on March 22, it adjusted prices in all fields in which it is purchasing crude. These adjustments in the San Joaquin Valley fields did not conform to Standard's schedule. In most Valley fields, Standard posts $0.65 per bbl. for all gravities between 14 and 19.9, whereas Union posts a separate price for each gravity, generally ranging from $0.61 for 12.5 to $0.76 per bbl. for 19.5 gravity.

For light oils, Union makes a smaller reduction than Standard. At Rio Bravo, Union posts a top price of $1.24 per bbl. for 42.5 gravity, whereas Standard's top price for any gravity in that district is $1.19 per bbl.

Changes made by Union in the Los Angeles Basin fields, which have not at this writing been adopted by any other purchasing company, provide for a minimum increase of 5c per bbl. and a maximum increase of 13c per bbl. in the Signal Hill field. Posting for 26.5 gravity oil remains unchanged at $0.99 per bbl., but all gravities below 26.5 are increased and all gravities above are decreased.

Union has also changed its method of computing crude payments. Prices for gravities between those quoted are calculated proportionately to the nearest cent per barrel.

Mid-Western Quotas Hiked During April

N. P. N. News Bureau

TULSA, March 31.—Reflecting increased demand for southwestern crudes, the regulatory bodies of several Mid-Continent producing states again increased crude production allowables affecting April production.

Kansas, which is nearest the mid-western refining center and in line for a "first try" at demand that cannot be supplied from Illinois, increased its April allowable 12,500 bbls. over March. The 210-700-bbl. April allowable is the highest in Kansas' history and represents an even 10,000 bbl. increase over the Bureau of Mines' demand forecast.

Louisiana crashed through with a 300,893,bbl. April allowable, 5297 bbls. above the March figure and 1193 bbls. above the Bureau's demand estimate.

Arkansas' April allowable of 72,024 bbls. is 3676 bbls. below the Bureau's forecast and 2698 bbls. above estimated production on March 7.

Texas Sets Quota

After considering testimony presented at its recent 4½-day proration hearing, Texas Railroad Commission announced it had distributed "equitably over the state as a whole," the state's total allowable of 1,325,291 bbls. Texas' production April 1 is expected to total about 30,000 bbls. below the Bureau of Mines' forecast, with this differential narrowing as new wells are brought in. Panhandle shutdown days were reduced from 5 to 4. East Texas will have 9 shutdown days and remainder of state, 10.

Oklahoma dropped another 5 oil fields from its "prorated list" and upped allowable in flush fields to make up the difference, so total April allowable would average out 400,000 bbls. daily. This is unchanged from March, although actual production at one time exceeded the allowable, but was still within the Bureau's March forecast. Oklahoma's estimated demand by the Bureau has been whittled down gradually and the April allowable is only 29,300 bbls. below this forecast.

Oil Compact Legislation Passed by N. Y. House

N. P. N. News Bureau

NEW YORK, April 1.—Legislation authorizing New York's participation in the Interstate Oil Compact passed the Assembly March 27, and passage by the Senate is almost assured, a compact representative said. After approval by the governor, however, the measure will not become effective unless or until Pennsylvania enacts a similar law.

The New York bill, A-2129, provides that the Governor shall be the official representative, or may offer a substitute representative as long as this representative is a resident of New York and a state oil producer.

Louisiana's entrance into the compact has been approved by the legislature and now awaits approval signature of Gov. Jones. Reports from the state capitol indicate his signature is expected soon.

TNEC Submits Final Report

N. P. N. News Bureau

WASHINGTON, March 31.—Among recommendations in Temporary National Economic (Monopoly) Committee's final report, filed today, were: a deficiency appropriation for anti-trust division of $500,000 for Federal Trade Commission, Department of Justice and Security Exchange Committee to study price systems and legislation declaring identical price bids, uniform price increases, price leadership and higher-domestic-than-export-prices, to be prima facie evidence of anti-trust violations.

Greater investigative power for the Justice Department and the FTC were asked, with additional power to strengthen Clayton Act to provide more rigid scrutiny of mergers and more power to break up interlocking relationships. Closer supervision of trade associations, publicity of their activities and clarification of their legitimate spheres of action, were also recommended. Roy C. Cook's recently released TNEC monograph on "Control of The Petroleum Industry by Major Oil Companies" was not mentioned. Report did not specifically mention oil.

Credits Work of A. P. I.

Other recommendations were: graduated corporation income tax high enough to make big business demonstrate its efficiency; national charter legislation setting standards for national corporations; repeal of Miller-Tydings re-sale price maintenance act; anti-basing point law, federal-state committee to work toward eliminating trade barriers; strengthening of patent laws to curb "improper" use of patent privilege; increasing of civil penalties and maximum $50,000 criminal fine under Sherman anti-trust act.

Chairman J. C. O'Mahoney, acknowledged in statement to Senate, the co-operation given by oil industry, saying:

"The petroleum industry, for example, under the guidance of the American Petroleum Institute, gathered a tremendous amount of material, expended a large sum of money, and came before the committee at its public hearings and made presentation of the picture of the oil industry as those who are in charge of that industry believe that picture to be; and there has been a great demand for that picture."

NPN's Log
On Oil Legislation

Oil legislative information, summarized below, is based on reports deemed reliable although NATIONAL PETROLEUM NEWS assumes no responsibility for the accuracy or completeness of this information.

CONGRESS

House Bill

H. Res-153, Vinson, Ga.
Provides for appointment of board to investigate feasibility of construction of pipeline from Baton Rouge, La., to Port St. Joe, Fla. To Military Affairs Committee.

BILLS INTRODUCED

Maryland

H-832, Dempsey
Anti-diversion constitutional amendment. To Constitutional Amendment Committee.

Missouri

S-137, Roberts
Regulates transportation of nitroglycerin and other explosives by motor vehicles.

New York

S-2013, Condon
Creates temporary 9-member commission to study distribution and apportionment to municipalities of motor fuel tax moneys; appropriates $5000. To Finance Committee.

Oklahoma

H-390, Whiteneck, et al
Defines liquid petroleum gases and establishes a liquefied petroleum gas department, designates state fire marshal to be ex officio state liquid petroleum administrator, provides for appointment of 2 inspectors, provides for rules and regulations, a system of licensing installers and penalties for violations.

H-399, Cherry
Authorizes State Board of Affairs to accept bid and let contracts for drilling oil and gas wells on state lands not heretofore leased.

S-228, Gary
Exempts school districts from taxes on gasoline bought for use in district owned and operated buses.

Pennsylvania

H-952, Haines
Provides for refunds of taxes to persons using liquid fuel for purposes other than in automobiles, motor boats and aircraft.

H-1007, Bentzel
Anti-diversion amendment.

Rhode Island

H-926, Huey, et al
Regulates transportation of inflammable liquids. To Judiciary Committee.

H-953, Hopkins
Exempts motor vehicles used for transporting school children from gasoline taxes. To Finance Committee.

South Carolina

H-453, Grant, et al
Reduces gasoline tax from 6 to 5c a gal. To Ways and Means Committee.

CHANGED STATUS

California

S-953, Tickle
Relating to motor vehicle fuel license tax refunds. Passed Senate.

Colorado

H-930, Coleman, et al
Excludes filling stations and bulk plants from the term "store" and changes amount of license fee to be paid. Passed Senate.

Georgia

HR-44-239B, Sabados, et al
Suspends collection of gasoline taxes on fuel used for governfent-owned training planes. Passed Senate.

Illinois

H-324
Requires persons, firms or corporations drilling oil wells to pay a fee of $100 for authority to do so and such fee shall accompany a statement and map filed with Dept. of Mines and Mining. Postponed for 2 weeks.

Iowa

SJR-1, Baldwin
Anti-diversion constitutional amendment. To Governor.

S-418, Evans
Provides for weighting and inspection of motor vehicles and trailers. Passed Senate.

Kansas

S-35, Cole
Same as H-47. Relating to ton-mile tax and providing for cancellation of delinquent taxes. Passed Senate.

S-364, Oil and Gas Committee
Prevents pollution of water supplies by having owners or operators plug well before abandonment. Passed Senate.

S-346, Assessments and Taxation
Eliminates benzoil, benzene and naphtha from "motor fuels," also all combustible gases existing in gaseous state at 60°F. Passed Senate.

Massachusetts

H-1072, McCarthy
Provides for governors limiting motor vehicle speed to 50 m.p.h. Killed in Senate.

Michigan

HCR-34, Thompson and MacKey
Authorizes Governor to enter oil and gas conservation agreement and to name a representative to attend Interstate Oil Compact meetings. Passed House.

Minnesota

H-258, Swanson, et al
Same as S-136. Apportions $1,200,000 of gas tax to state-aid roads. Passed House.

New Mexico

S-32, Smith
Provides for extension of Interstate Oil Compact Commission. Passed House.

H-155, Payne
Provides for collection of 0.5c gasoline tax for counties. Killed in House.

S-62, Clark, et al
Authorizes counties wherein city levies 1c gasoline tax to make same levy outside municipal limits. Passed Senate.

Ohio

S-71, Gray
Extends liquid fuel excise tax for 2 years to March 31, 1943. Passed House.

Pennsylvania

H-376, McLane, et al
Requires labelling of reclaimed of

Membership of Arkansas Oil & Gas Commission

Invested in the Arkansas Oil & Gas Commission is the authority to enforce Arkansas' so-called "model" oil and gas proration law. Taken at the commission's last proration hearing, this picture shows the commission in session with Gov. Homer M. Adkins. Seated, left to right, are Commissioners R. J. Short, El Dorado; Basil Hoag, Texarkana; O. C. Bailey, El Dorado, chairman; Ed Hollyfield, El Dorado and J. D. Reynolds, Camden. Standing, left to right, are Commissioner Bob Warnock, Jr., Magnolia; E. B. Keith, commissioner and mayor of Magnolia; Gov. Adkins; and Alec Crowell, El Dorado, commission director-engineer

re-refined lubricating oils. Passed House.

South Carolina

S-336, Brown
Provides every gasoline dealer add amount of tax levied to price of gasoline, which tax shall be a levy on the consumer. Passed Senate.

Texas

H-119, Martin
Same as S-31. Creates Oil and Gas Commission. Killed in House.

APPROVED

Arizona

S-110, Coxon
Limits single unit trucks to 35 ft. in length; combinations to 65 ft.

H-69, Dudley
Imposes a use tax of 5c per gal. on all motor fuels; requires obtaining a fuel use tax permit; imposes a lien against vehicle.

H-70, Dudley
Imposes use fuel tax on fuel imported into state in motor vehicle tanks larger than manufacturers' specifications.

H-101
Provides for regulation of storage, handling, location, installation and operation of liquefied gases.

Delaware

H-16, Richards
Limits gross weight of trailers and load to 22,000 lbs.

New York

A-399, Budget Bill
Same as S-363. Continues emergency taxes, including two 1c per gal. sales taxes on motor fuels.

Ohio

S-71, Gray
Extends liquid fuel excise tax for 2 years to March 31, 1943.

Utah

S-44, Bailey
Graduated chain store tax.

'Gas' Loss Allowance Upheld in Minnesota

Special to N. P. N.

MINNEAPOLIS, April 1. — Minnesota Supreme Court, in a decision handed down March 28, ruled that the 3% shrinkage allowance granted Minnesota distributors was a definite, flat amount. The case, titled "T. J. Arneson, plaintiff, vs W. H. Barber Co., respondent", brought final settlement to some 29 cases involving oil companies in Minnesota in which it was alleged they were entitled only to their actual shrinkage losses, not to exceed 3%.

Court's opinion, written by Justice Julius J. Olson, stated: "Legislative determination of what should be allowed for 'evaporation and loss' in determining the base upon which gasoline taxation should rest is . . . held to be valid against the constitutional attack here made."

Plaintiff had claimed that actual shrinkage losses were less than the 3% allowed by statute, and that the defendant had therefore collected an amount in excess of the tax as measured by the statute, on the premise that the 3% allowance was a maximum. Defendant contended that such an interpretation was an attempt to modify and amend the act itself, thus making it a new and different act than the one adopted by the legislature.

Justice Olson pointed out that it would be "physically impossible to trace the contents of a tank car so as to exact a gallonage tax from the ultimate user", and that it would be "obviously difficult to determine exact evaporation and spillage".

In a case involving the shrinkage allowance in the state of Connecticut, Hartford County Superior Court Judge King left the burden of proving actual shrinkage losses up to the distributors. Effect of this decision is still reverberating, with Connecticut distributors refusing payment of alleged back gasoline taxes, and the state motor vehicle commissioner indicating he will go to court to force payment.

C.I.O. Oil Head To Meet With Humble Officials

HOUSTON, April 1.—C. B. Harris of Houston, director in charge of Humble Oil & Refining Co.'s industrial relations has replied to request of Jack Knight, international president of the oil workers' (C.I.O.) union, for an audience with Humble officials, and to explain why the C.I.O. union is not authorized to represent Humble employes.

Mr. Knight is said to have requested the conference in an effort to increase the wage scale paid Humble employes.

Efforts to organize the Humble refinery employes under the C.I.O., was indicated when Mr. Knight told NATIONAL PETROLEUM NEWS that steps might be taken to have his union represent Humble employes as their bargaining representative.

Texas Strike Bill Expected To Pass

Special to N. P. N.

AUSTIN, April 1. — Texas will keep its industries running 24 hours a day, and any labor agitator who thinks otherwise will find himself picking cotton on the state's 75,000 acres of prison lands, Gov. W. Lee O'Daniel warned Monday night in a radio address.

"We won't stand any foolishness from wild-eyed agitators drifting into this state. They had better conduct their business somewhere else," O'Daniel said.

Governor predicted the Senate will overwhelmingly pass his anti-strike bill. Approved by the House, March 27, it will be considered by Senate committee sometime today.

Federal Control Unnecessary Wilson Tells Cole Committee

(*Continued from page* 14)

and synthetic rubber from petroleum.

Not only can all military demands for petroleum products be met without difficulty, but there seems to be no probable necessity for any civilian curtailment, barring the possible shortage in transportation to the East Coast which I have already mentioned. Substantial civilian curtailment in this country would not only be far more disruptive than it has been in Europe, but would deprive Federal, State, and local Governments of much needed revenue at a critical time.

Offers To Supplement

The foregoing gives a broad picture of the petroleum industry in relation to the defense program, which I will be glad to supplement in detail in executive session if the committee so desires.

The industry has shown a very co-operative attitude in all its contacts with the Petroleum Unit, and has repeatedly indicated its willingness to do anything within reason to prepare to meet all defense needs as soon as they are informed with regard thereto. For example, at the request of the Navy Department and the Maritime Commission, the tanker owners and operators have set up a Committee to supply these organizations with all desired information as to tanker capacities, operations, construction programs, etc., and they have agreed that the Navy Department may requisition any desired tanker at any time and the Committee will assume the task of dividing the burden equitably among all the tanker operators.

With regard to the matter of the proposed pipe lines in Southeastern United States, I feel that, for reasons already indicated, the construction of such lines is definitely desirable from a defense standpoint and that to permit one interstate carrier to block the right of way of another interstate carrier, especially under the emergency conditions we are facing, is indefensible. Pipe lines also have the advantage of being less vulnerable to hostile attack and more easily repaired than are most other methods of transportation.

Transportation Cost

While the railroads and tank trucks could undoubtedly handle the amount of oil which would be carried by any one or two pipe lines, the cost of such transportation would be two or three times as great, and to be properly prepared for an emergency in the Atlantic we need to augment all methods of transportation to the East Coast, because the combined efforts of all of them would probably be inadequate. The Southeastern section is the only part of the country which does not now have the benefit of pipe line transportation, and yet from a national defense viewpoint this is the most important place to have it in order to reduce the amount of tanker transportation required around the Florida Peninsula. I understand that one of the proposed lines will obviate the need for about five average tankers, and even this could readily be expanded.

It seems fortunate that it is possible to have such facilities constructed by private capital if the legal obstacles can be eliminated. It is difficult to understand the unwillingness of the Georgia legislature to pass the necessary enabling legislation in view of the recent united recommendations of the President and the Secretaries of War, Navy, and the Interior, but it would seem that it must be based on a lack of appreciation of the seriousness of the situation.

American Announces Hydroforming Plant

N. P. N. News Bureau

CLEVELAND, March 31. — The first commercial hydroforming plant, incorporating a process for catalytic reforming of 40-45-octane naphtha to 80-octane motor fuel (A.S.T.M. Motor method) was announced March 27 by American Oil Co. The plant, which is located at Texas City, Texas, has a capacity of 7500 bbls. per day and yields 80% high-octane motor fuel.

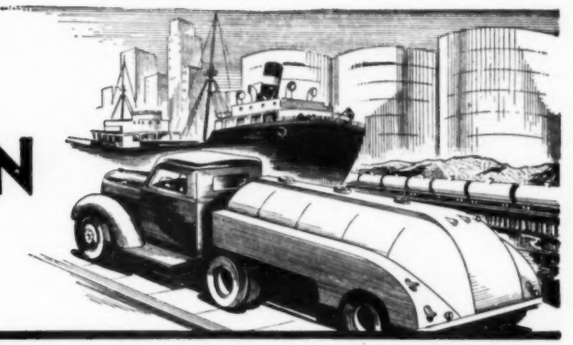
By changing operating conditions, the process can produce a high grade aviation gasoline, or can be modified to produce 5,000,000 gals. annually of toluene, which was about 25% of the total U. S. production in 1939. This is reported to be of particular importance from a military standpoint.

The new unit was constructed without the usual preliminary step of semi-commercial pilot plant operation, and involved some difficult problems. More details of the process are told in NATIONAL PETROLEUM NEWS' Refining Technology edition this week.

SAN ANTONIO, Tex., March 29. — Entire output of Three Rivers Refinery, Three Rivers, Tex., has been purchased by The Akin Gasoline Co. of Tulsa, W. B. Pape, Three Rivers sales manager, reports.

"Our refinery has made extensive improvements during the past year, and has crude available far in excess of its 2000 bbl. per day capacity", Mr. Pape said.

OIL TRANSPORTATION



Deep Rail Cuts Seen by WTLC

ST. LOUIS, March 29.—Drastic reductions in rail rates on crude shipped from Wyoming producing points to Minnesota, Iowa and Nebraska destinations have been proposed in an effort on the part of Wyoming producers to enlarge markets for their oil, reports here today indicate.

Western Trunk Line Committee is considering a proposal that calls for reductions of from 37.3c to 63.7c per bbl. in rates from Casper, Glenrock, Newcastle-Osage, Greybull and Cody, Wyo. to St. Paul Park, Minneapolis, Minnesota Transfer, St. Paul, Owatonna, Minn.; Des Moines, Iowa Falls and Mason City, Iowa; and Omaha, Neb.

The 85.4c a bbl. rate from Casper, Glenrock and Newcastle-Osage to the Minnesota-Iowa destinations and the 62.1c a bbl. rate from the 3 origin points to Omaha are representative of the proposals.

Another proposal filed with Southwestern Freight Bureau calls for a 27.9c a bbl. reduction, to 87c a bbl., on petroleum oil residuum shipped in tank cars from Beckett, Okla. to Minneapolis, Minn. Many of the destination points covered in the two dockets at one time were served with crude from Illinois.

Rail Cuts Proposed In Mid-West Areas

N. P. N. News Bureau

TULSA, March 31.—Another attempt to coax petroleum tonnage from trucks to rails is indicated in an application filed with the Western Trunk Line Committee seeking "truck-competitive" rail rates on petroleum products shipped from Nebraska, Iowa, Kansas City and other southwestern refining centers to Nebraska destinations.

This represents the second effort by rails to make their rates competitive with trucking costs. In April last year, they placed into effect what they thought would be "truck-competitive" rail rates, but now they report that instead of increasing rail tonnage, total volume handled actually is 15% less. Truckers now haul 50% of the petroleum tonnage moving from Kansas to Nebraska, rails claim. So this time, rails propose a set of rates based on the Kansas scale, which it is believed will bolster tonnage.

For the most part, the proposed rates cover shipments within a 300-mile radius of origin point and call for reductions ranging up to 0.0165c a gal. on gasoline shipped from Falls City to Nebraska destinations; 0.395c from Superior and Omaha, Neb.; 0.0231c from Sioux City, Iowa; 0.528c from Kansas City; and 0.495c from Scottsbluff, Nebr.

In the case of shipments from Kansas City, the proposed schedule of rates would apply to liquefied petroleum gas, lubricating oils and other petroleum products.

ICC Calendar On Oil Trucking

Northern Truck Line, Inc., Williston, N. Dak. (MC 63513, sub. 4). Issuance of a certificate approved, upon compliance by applicant with certain conditions, to operate as a common carrier of liquefied petroleum products, in bulk, in tank trucks, from points in Wyoming to points in North Dakota, over irregular routes.

Natural 'Gas' Rail Cut Studied by S.W.F.B.

N. P. N. News Bureau

TULSA, March 31.—A proposal calling for reductions of as much as 1c a gal. on natural gasoline shipped from Breckenridge and Ranger, Tex. origin points to Oklahoma refinery centers is being considered by Southwestern Freight Bureau.

It is proposed to establish a 20c a cwt. rate, 1.32c per gal., on this traffic to Ardmore, Cushing, Drumright, Sand Springs, Oklahoma City, Tulsa and Wynnewood, Okla. For the most part, the proposed rate represents reductions of 0.0132 to 0.0244c a gal., although on shipments to Drumright and Sand Springs the cuts represent approximately 1c a gal.

Mid-West Refiners View ICC's Decision As 'Door Opener' For Lower Rail Rates

(*Continued from Page* 11)

either the rails or the pipelines as to their next moves.

But based on the assumption that rails publish tariffs incorporating ICC-prescribed maximum rates, effective June 11, calling for reductions of 0.198 to 1.056c a gal., southwestern refiners indicate they will be able to (1) maintain present volume of petroleum business in the Mid-West and North; (2) regain a portion of that business lost to refiners near points of consumption who utilize truck transportation; (3) reduce by the amount of the prescribed rail rate cuts those advantages now held by refiners utilizing certain competitive forms of transportation, and (4) maintain present business without the concessions now necessary.

Benefits to Rail Shippers

Possibly the biggest benefit to be derived by rail shippers, if rails adopt only the minimum relief afforded in the ICC decision, is possible return of business now being supplied by refiners who utilize truck deliveries to enter nearby marketing areas.

It was pointed out that to Des Moines, truck shippers are said to have an advantage of about 0.5c and to Sioux Falls, S. Dak., about 0.625c over rail shippers. Maximum rail rates to these 2 points as prescribed by ICC call for reductions of 0.46c and 0.66c a gal., respectively. Since conditions at Des Moines and Sioux Falls are representative throughout most of the truck-destination territory, southwestern refiners see an opportunity to regain parts of this business, especially that in southwestern Iowa, Nebraska and southern South Dakota.

The ICC decision comes as a last minute reprieve to many rail-shipping southwestern refiners, it was reported. Many were faced with loss of business from their customers who would have been forced to obtain their supplies from refiners utilizing cheaper forms of transportation. Many rail shippers had already been advised by their jobbers that unless favorable action by the ICC came shortly, they would be forced to sever connections with rail shippers. The ICC decision will forestall, at least for the time being, these switches in sources of supply, it is said, until jobbers can take another look at their individual operations in the light of its provisions.

Pipeline 'Advantages'

Testimony presented in the case indicated, according to rail shippers, that in some cases pipeline refiners passed on to their customers at least a portion of the advantages accruing from use of the cheaper transportation facilities. Rail shippers believe that since the ICC has prescribed pipeline rates, based on cost of operation plus reasonable return, that pipeline shippers no longer will be in position to carry on this practice, they said.

Lower rail rates will enable rail shippers to meet water competition to the extent of the actual reductions in rail rates. Barge competition has been "dealing us fits in certain sections," rail-shippers claim. Advantage of water deliveries over rail shipments has been placed by rail shippers at 1c to 1.25c a gal.

In summary, some rail shippers indicate benefits resulting from the ICC decision will "whittle down the extent to which price concessions must now be made by rail shippers to maintain their business." They point out that it has been detrimental to refinery netbacks to meet this competition, especially since these concessions "came out of our pockets."

Maximum rail rates prescribed by the ICC are not considered sufficiently low to be "pipeline-competitive." And with this in mind, rail shippers say they expect to regain little of their former business lost to pipeline shippers. "But should rails consider multiple-car or single-car rates sufficiently low to be pipeline competitive, then

this situation may be changed," one refiner remarked.

If so-called "maximum" rates set forth in the decision are adopted by rails, then some rail-shippers may be expected to complete plans for construction of feeder lines from their plants to the nearest pipeline terminal, provided preliminary arrangements with the pipelines prove favorable. Thus the advantages of pipeline transportation, representing savings of from 0.8c to 1c a gal. over rail rates in representative instances, would be passed on to the rail shipper. But it has been pointed out that the advantages of pipeline transportation would be available only to those refiners adjacent to existing terminal points along the pipelines.

May Be 'Door Opener'

Until rails announce what actions they expect to take, rail shipping refiners will have to hold in abeyance any formal plans for utilizing the ICC decision to their advantage. And as some shippers pointed out earlier, the decision prescribes maximum rates, with suggestion by ICC that rails use their managerial discretion in meeting competition. Some shippers look upon the maximum rates prescribed by the ICC as merely the "door opener" for a general readjustment in petroleum rail rates to meet competitive forms of transportation.

In some quarters it is indicated prescribed pipeline rates may be construed as below cost of operation and as such may be attacked by pipelines as confiscatory. No statement by pipeline officials has been made.

U. S. Seizes Axis Tankers

N. P. N. News Bureau

NEW YORK, March 31.—At least 5 tankers belonging to Axis or Danish fleets were boarded the past week-end when the U. S. Government forcibly took over all Italian, German and Danish vessels in American territorial waters. The tankers had an approximate total capacity of 355,000 bbls.

One Italian tanker, the Brennero, was seized in Newark, N. J., loaded with 5,000,000 gals. of diesel fuel which her own crew admitted was for Axis surface and sub-sea raiders preying on Atlantic shipping lanes. In Boston, police and government authorities pounced upon the Pauline Friedrich, an ancient German tanker of 40,000 bbls. capacity and the immobilized Danish Emma Maersk, loading 110,000 bbls.

Another Danish ship was boarded at Jacksonville, Fla. She was the Caroline Maersk, sister ship of the Emma, and has a capacity of 100,000 bbls. The fifth boat was the Italian Colorado, 50,000 bbls. She was taken over at San Juan, Porto Rico. Most of the boats were aged with the exception of the 2 Danish tankers, which sources in the trade described as "dandy new ships."

Tanker Market Reported Tight

N. P. N. News Bureau

NEW YORK, March 31.—Tanker market was "tight," with demand heavy and boats scarce, according to reports in the trade today. One tanker was reported fixed for 75,000 bbls. of No. 2 fuel oil at 62c, up 2c per bbl. On this basis, coastwise rates for gasoline would be approximately 55c; kerosine, 58c, it was said.

No "dirty" boats for Gulf-N. Hatteras were reported chartered during the past week. "Dirty" tonnage was "tighter than 'clean'," some boat men said. Last paid was 48c for 30 gravity or lighter crude; 55c for 10-19.9 gravity fuel. Because of higher Venezuela-N. Hatteras fixtures, next "dirty" coastwise open spot charter is expected to go at increased rates.

Export Licenses Waived For Ships' Bunkering

N. P. N. News Bureau

WASHINGTON, March 31.—Commerce Department today reported state department as ruling that no export license is required for bunker fuel to be used in departing ships; also that liquefied petroleum gases, including butane and propane, are exempt, but containers of the same with a capacity of 30 gals. or more are subject to export license.

Tanker Captain At Loss To Explain Explosion

N. P. N. News Bureau

NEW YORK, March 31. — Stating that he had seen no evidence of dissatisfaction or "un-Americanism" among his crew, Captain John Saxon, master of the explosion-shattered Cities Service tanker "Denver," told an investigation board of the Bureau of Marine Inspection and Navigation that he was at a loss to explain what caused the sudden blast and ensuing fire that ripped his ship, 80 miles south of Cape Lookout, N. C., March 24.

The vessel was carrying 104,500 bbls. of crude loaded at Port Arthur for Boston.

Truck Load Limits, Gallonage Capacity Viewed by Army Corps as 'Bottlenecks'

N. P. N. News Bureau

NEW YORK, March 29. — Army Air Corps is still troubled with legislative problems concerning tank truck delivery and gallonage capacity.

Two new types of tank trucks, the F-2 for gasoline and the L-1 for lubricating oils, have recently been designed by Army engineers to expedite re-fueling operations, and any legislation restricting their weight load, their gallonage capacity or their functioning in any way, is regarded by the Army as a hindrance to the defense effort and is so opposed.

Several states, including North Carolina, Indiana, Wyoming and Vermont, have introduced bills to restrict the movement or size of tank trucks and trailers. Pressed by the need of co-ordination on behalf of national defense, legislators in these states have voted such bills down.

Tank Transport Bills

A Wyoming bill which aimed to make it unlawful for a motor vehicle to transport more than 2000 gals. of inflammable fuel was withdrawn by its author. A bill prohibiting transportation of more than 1500 gals. of gasoline, kerosine or any other motor fuel over state highways of North Carolina was reported unfavorably in committee, and died upon adjournment of the legislature.

In Minnesota, the tank truck "battle" continues to be waged, the load limitation issue seemingly far from dead. The measure which would prohibit motor vehicles from carrying more than 3000 gals. of inflammables on the highways was introduced in the Senate and was voted out of committee favorably by a count of 9 to 6. Reportedly, this indicates determination of the railroads to force a reversal of strength in the House. Nothing is certain as to when the bill will be voted on by the Senate.

Atlantic Launches New Ocean Tanker

NEW YORK, March 29.—Atlantic Refining Co. launched a new addition to its tanker fleet on March 15, as The S. S. E. H. Blum, a 19,400 ton oil carrier was sent down the ways of the Sun Shipbuilding and Dry Dock Co. at Chester, Penn. Mr. E. H. Blum is a vice-president of Atlanic in charge of domestic production.

Mrs. Blum, christened the big tanker with a bottle of champagne across the bow.

This newest Atlantic tanker will be commissioned April 1 bringing the company fleet to 24 boats, all of which operate between the Texas Gulf ports and Philadelphia. Sister ship of the S. S. Robert C. Tuttle and similar in design to three other Atlantic tankers, the S. S. E. H. Blum has a cargo capacity of 154,000 bbls.

Canada Pipeline Deduction Reduced for Turner Valley

Special to N. P. N.

TORONTO, March 26.—By an Alberta order in Council the pipeline deduction for Turner Valley crude, transported over Valley Pipe Line Co.'s line from Turner Valley to Calgary has been reduced from 1% to ¾ of 1%. The change means that producers will be paid for 99¼ bbls. out of every 100 delivered over the pipeline, and is equivalent to an increase in the posted price of crude oil of about 1/3c per bbl.

Oil Truck Tonnage Up 22% in February

N. P. N. News Bureau

WASHINGTON, March 31.—Tonnage hauled by truck transporters of petroleum products during February was 22.5% ahead of February, 1940, American Trucking Ass'ns. report.

Transportation of petroleum products accounted for slightly more than 10% of the total tonnage reported, despite a decrease of 11% from January.

Maritime Commission Approves Tanker Sales

N. P. N. News Bureau

WASHINGTON, March 28. — Maritime Commission has announced approval of sale by Socony-Vacuum Oil Co. of tankers Yorba Linda and Algonquin to Petroleum Shipping Co., Ltd., with transfer to Panamanian registry, on condition vessels be redocumented and brought back to U. S. continental ports upon demand of government.

Yorba Linda, which has gross tonnage of 6900, was built in 1921, while Algonquin, built in 1920, has gross tonnage of 7229. Both vessels have a speed of about 10½ knots.

Commission also reported receipt of applications for sale by The Texas Co. of Tanker New York to Texas Co., Inc., and by Roy W. Chamberlain for sale of Tanker Bacol to Panamerican Shipping Co., both vessels to be transferred to Panamanian registry.

MORE WORKERS DRIVE in Detroit,

New Stations are Building on Routes to Plants

DETROIT, busy putting wheels on the Army and turning out passenger cars and trucks at a near-record pace, is in the midst of a boom that has boosted gasoline gallonage as much as 24% above last year for some oil marketers.

Even so, the Motor City's defense boom is just beginning. It will gain momentum through the spring and summer, reaching its crest in early fall when volume production starts on airplane engines, tanks, bomber assemblies and parts, shell cartridges and other war materials.

Actual, direct defense orders totaling $663,779,106 were in the hands of Michigan manufacturers—mostly in Detroit area—at the middle of March. Thousands of construction workers are laboring day and night to complete airplane engine, tank and other defense plants.

IN THE automotive industry, defense orders will add another 150,000 employes to the payroll by fall. Probably 100,000 of these new workers will be at plants in the Detroit area, which means an increase in personnel of over 50% for this area. Employment in the automotive industry at present is about 450,000, counting plants in all states.

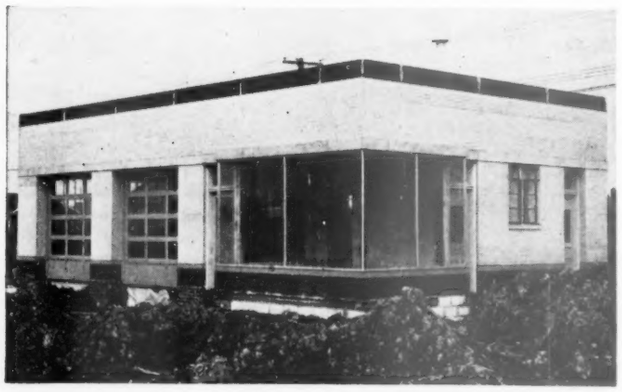
This insures a continued gain in gasoline consumption for the Detroit area. Automotive plants are widely scattered. Several new plants are going up on edge of the metropolitan area. Workers travel as much as 25 miles to and from the plants. Crowded parking lots—at one plant there are 27,500 cars parked daily—is evidence of how important is the private automobile in getting defense workers to their jobs, even in metropolitan areas.

Parking lot at Chevrolet gear and axle plant

DETROIT has 13 marine terminals, 8 operated by independent marketers (some of them terminaling for other suppliers) and 5 by major companies. But navigation is closed from early in December through March. In the winter, Detroit is dependent for its gasoline supplies upon 3 sources: (1) storage, (2) a nearby 20,000-bbl. major company refinery at Trenton and (3) inshipments from Toledo by a gasoline pipeline and by rail and truck from outside the state and from a dozen oil field refineries operating on Michigan crude.

Gallonage increase this winter for some marketers has been so sharp and sudden that at times they have been operating with a back-log of only a few hours supply in their tanks. An increase of 10 to 15% in 1941 (which seems a conservative estimate) would add another 40 to 60 million gallons to Detroit's gasoline consumption, which was about 410,000,000 gals. last year. So, these Detroit marketers, "doing a

ACROSS THE STREET from a shopping center and new housing development on a well-traveled route, this Socony-Vacuum station fulfills the three "musts" for a good location. It is in Spring Wells Park, west of Dearborn, and is the only station in this new community being developed by Ford Foundation



NEW SHELL STATION going up at Greenfield and Chicago Boulevard on western outskirts of Detroit, north of Dearborn. Both streets carry a heavy volume of traffic. In the neighborhood, many new homes are being built

UNDER CONSTRUCTION at Warren and Wyoming on western edge of Detroit, this new station of Gulf Refining Co. is on one of most heavily-traveled routes to Dearborn industrial area. Station will have white finish when completed according to Gulf design

summer gasoline business in the dead of winter," face the prospect of having to expand their tankage and transportation facilities to take care of their increased volume when the summer rush starts.

The seasonal increase this year will coincide with gains from defense boom moving into high. Peak of summer touring season in August will be just about the time that industrial plants will be adding 100,000 more men to their payrolls to work in new plants being built for defense orders.

All of this adds up to an expected gallonage gain such as Detroit marketers never experienced before.

Several oil companies with programs for station building and modernization stand to "cash in" on Detroit's defense boom. Station building goes hand in hand with construction of hundreds of new homes in many sections. One company, for example, has built or completely remodeled 62 stations in the metropolitan area in the past year. Another company completed 25 stations on new sites and rebuilt on 10 other sites last year, and will do about the same this year; 15 are under construction now. Another company built "only 5 last year, but more this year."

Gasoline gallonage gains for 9 Detroit oil marketers during January-February as compared with same 2 months of last year, were: 24%, 21%, 17%, 13%, 12%, 12%, 10%, 8% and 4%. Included among these are percentage gains for 3 distributors and 6 major companies, all handling different brands. The marketer with an 8% gain for January-February reports a 22% increase for first half of March. Several others said preliminary figures indicated March was showing a larger gain than either of the first 2 months of 1941.

THIS gallonage boom comes at a time when the Detroit retail gasoline market is firmer than it has been in years, with the prevailing dealer margin on branded gasolines at 3.3c and discounting at a minimum, according to dealer association leaders. But they regard this margin as inadequate with station attendants' wages higher and other operating costs increasing. So, they plan a "legal" move under Michigan fair trade legislation that will raise the "floor" under retail gasoline prices in Detroit so as to provide a minimum margin of 3.5c, it was said.

One harbinger of increased gasoline consumption is the record-breaking pace of new car sales to residents of Detroit. January sales were 11,734 which topped by over 3000 the sales in any other January, not excepting January, 1929. Sales in February totaled 17,608 which was higher than any single month in Detroit history, except May, 1929, when sales were 21,964.

Christmas buying sent department store sales index up to 203, or more than double the average for 1935-39. Only other month to exceed the 200 mark was December, 1929, which hit 221. January department store sales were at 88 and February, 97—both of which were highest in 10 years for these months.

Employment index for Detroit metropolitan area stood at about 123 for January and February. This was several points below same months of 1937; in 1929 the index was at 129 and 134, respectively, for first 2 months of year. Average weekly earnings, however, were $37.02 in January which was about $7 better than in 1937 (1929 figures not available).

Increased earnings of industrial workers is having its effect on the wage scale at stations and causing a considerable turnover at some stations. Some companies have lost office personnel, truck drivers and bulk plant employes. But it is the dealers who are hardest hit.

One dealer said he was paying an experienced, all-around man $42.50 a week at his station but pointed out that in the preceding week this man "made his salary for us by selling 4 radios." In other words, dealer's gross profit on radios sold by this experienced station salesman had amounted to over $40 in one week, besides his work at pumping gasoline, selling at the island and lubricating cars. "I don't believe you can get a good, all-around man for less than $35," this dealer added.

At one large station, which had had no labor turnover in 4 years, 15 men were lost in the past 3 months to

Be sure to get your share

Motorists for weeks have been setting new high records for off-season gasoline consumption, official figures show

Throughout 1941 they will burn 110 gallons for every 100 gallons they burned last year, Bureau of Mines estimators predict

The national emergency program will demand millions of gallons more—much of it of super quality

Fuel oil is strong and getting stronger as defense production swings into stride

It's a promising outlook

Add up these facts—then call on Universal

Find out what Dubbscracking and U. O. P. catalytic polymerization will do for you—and other Universal processes you may need to make special products Find out how soon you can have these processes installed in your plant

Enlist the friendly and effective help of Universal refining specialists

It is none too soon to get busy

Call U. O. P. now

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

ON THE ROUTE to Lansing and its automobile plants, this marketer's station—built last year—also has trade from workers at several plants in its neighborhood which have defense contracts

THREE BAYS WERE NOT ENOUGH at this Dearborn station, built a little over a year ago. Another deep bay is being added (left) for motor tune-up and wheel alignment. Location is on Schaefer road, a main artery from Ford plant

REMODELING this Hi-Speed station at Epworth and Tireman, in western Detroit, will be completed with addition of gleaming white tile to station's concrete block walls and the familiar Hi-Speed tower

defense industries. He said his wage scale for station men was $90-$100 a month.

Some trained automobile workers who had taken jobs at service stations during the depression have returned to the plants. On the other hand, some ex-automobile workers are making too much money as station lessees to be interested in going back.

The fast pace of the assembly lines is vastly different from station work. Some new automobile plant employes have quit and returned to their old station jobs, "where we can sit down once in a while between customers."

The automobile plant's wage scale has undoubtedly attracted skilled workers from all parts of Michigan. But they are finding that scarcity of homes and higher living costs makes the pay check buy considerably less than it would back home.

Automobile manufacturers disclaim any intent of "raiding" other industries for new plant workers. They do not expect it will be necessary to import skilled workers from any other state. Most of the automobile companies have greatly expanded their training programs and from this source they expect to get most of the new employes needed. Age of the trainees ranges from 18 to 25. One large plant takes them only if 18 or 19 years old. Many come right from high school. Their pay is generally 55 or 60 cents an hour, 40-hour week, during the three-month training period. After that, if qualified, they are placed in regular departments and advanced rapidly to 75c to 90c an hour.

These newly-trained workers will take their places beside experienced workers on machines or at the assembly bench. As the new man catches on, the experienced man is moved a notch higher himself. In this way, a steady stream of experienced workers will be available for defense jobs in plants that will turn out tanks, airplane engines and other war materials.

WOMEN will be placed in many jobs requiring patience, such as stringing ignition systems. Incidentally, there are many women now employed in the automobile plants running presses, polishing bearings, etc. For some companies, employment of women antedates the defense era.

For sometime now, the automobile industry's production lines have been rolling 13,000 Army motor vehicles a month, with a step-up to near 20,000 per month as the Army's expansion calls for them. By June, the U. S. land forces will have 190,000 motor vehicles and over a quarter million by fall. In addition, diesel engines for land and sea equipment are being turned out in increasing numbers.

Manufacturers have contracts for Army cars and trucks. This has meant a fairly simple retooling job in comparison with building of airplane engines and parts, tanks and some other defense materials which were out of the car manufacturer's line.

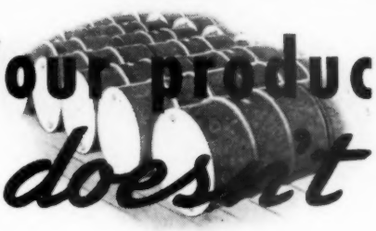
General Motors subsidiaries are constructing plants and installing new machinery at Flint, Saginaw and other points to fill $61,400,000 order for machine guns. Production will start late this summer. Other plants are preparing for and actually producing shell cases, projectiles, fuses, gun mounts and other defense materials.

Chrysler Corporation is building a quarter mile-long tank arsenal on the northeastern outskirts of Detroit just over the line in Macomb county, to fill a $55,000,000 order for 25-ton medium tanks. Through snow and sleet, construction workers have rushed the building so that first of these fast-moving fortresses are expected to roll off the line by early fall—ahead of schedule. Construction workers traveling to the project in automobiles have provided a nice gallonage for stations along the way.

One station on the route to the tank plant, opened a little more than a year ago, pumped 28,000 gals. of gasoline in January which was 10,000 better than in January, 1940. In February this dealer boosted his gallonage to 30,000. He has worked out a scheme whereby the tank arsenal workers leave their cars to be washed and lubricated in the morning, driving on to the job in a friend's car and returning the same way in the evening to pick it

He *has* to take chances

Your product *doesn't*



Meet a man who has to take chances—the man behind the wheel of a racing car. A bullet on wheels zooming down the straightaway . . . careening at terrific speed around curves . . . disaster, missed by inches!

Many products shipped in drums are taking chances, too—"racing" to their destination amid risks that make every mile a hazard. Yet this chance-taking is never necessary. Every product—your product—can be safeguarded by Tri-Sure Closures, the closures that eliminate leakage, waste, tampering, pilferage and substitution. Tri-Sure Closures have a seal which cannot be removed unless it is deliberately destroyed, a plug which is held tightly in place, a flange which assures complete drainage.

Send your next shipment to the "finish line" in the fine condition in which it started. Don't take chances with your reputation—be sure it is as untarnished tomorrow as it is today. You can do it by equipping every drum with Tri-Sure Closures. Write today for complete information.

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Reg. U. S. Pat. Off.

CLOSURES

Can you keep your stock loss

- This question is meant for EVERY BULK PLANT OPERATOR.
- The answer is an unqualified "YES" . . . confirmed by the experience of bulk plant operators by the hundreds.
- It is "yes" because of METERING CONTROL.

A COMPLETE, accurate check on all bulk plant operations is provided by this dual control, which also sets up a perpetual inventory and daily audit of all gallonage receivals, throughput and sales. ● "Unaccounted-for" losses are eliminated. Shrinkage is reduced to approximately ½ of 1% — regardless of size of plant or scope of operations. Product handling becomes more efficient. Accounting is simplified; tax computations are made easy.

The Stock Record System

Prepared by a C.P.A., thoroughly familiar with Oil Industry operations, this complete system of stock records and daily audit saves all time-wasting forms for private accounting and bulk plant bookkeeping people. It is part of the RED SEAL control plan.

The savings in gallonage, time, labor and money effected by Metering Control, quickly absorb the installation and maintenance costs of the metering system and *increase your profit margin.*

The RED SEAL Meter-Master System is applied after a Neptune field engineering study of your own bulk plant's individual requirements. When utilized in its entirety, as is often the case, the System comprises correctly balanced and coördinated facilities for metering barge and tank car unloadings, storage transfers, loading rack metering of delivery truck fills, and the metering of delivery tank trucks employed by the bulk plant operator.

It will pay you to look into this modern plan for cutting even ***unsuspected*** losses and conserving your profit. We suggest that, as a first step, you write for our new GENERAL PETROLEUM METER CATALOG. It discusses the metering practices involved, and gives valuable information on money-saving short-cuts.

NEPTUNE METER COMPANY, 50 West 50th Street, New York, N. Y. Branches in Atlanta, Boston, Chicago, Dallas, Denver, Kansas City, Los Angeles, Louisville, Philadelphia (Philadelphia Meter Co.), Portland (Oregon), San Francisco, Toronto.

METERS FOR BARGE AND TANK CAR UNLOADINGS

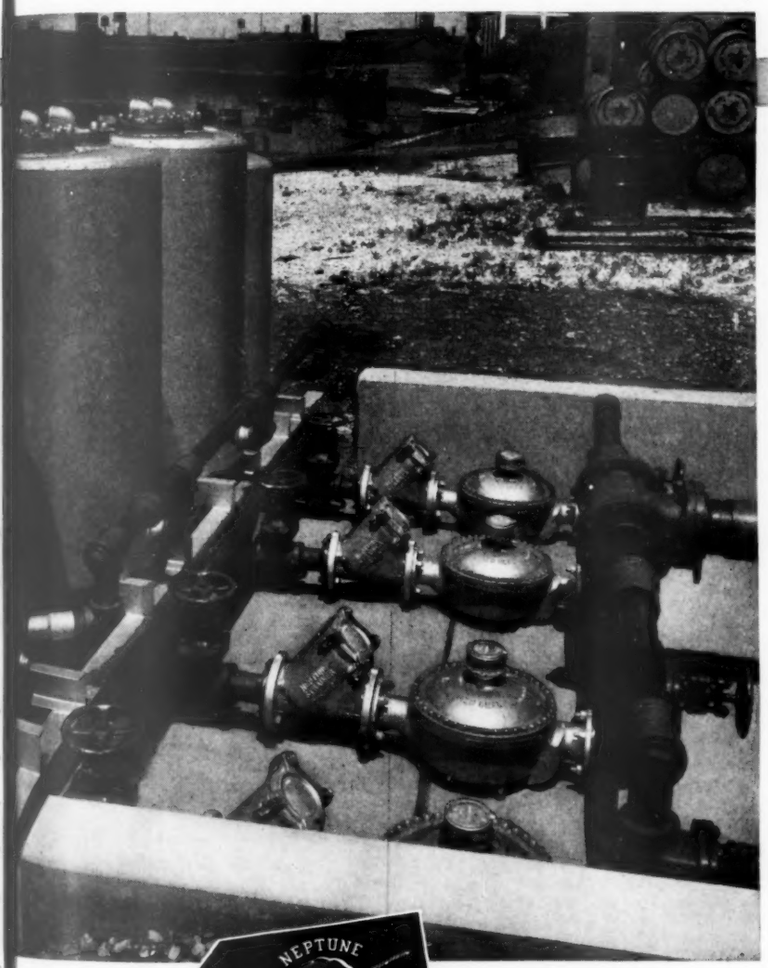
NEPTUNE

Metering Pays!
CONTROL—SAVE—PROFIT
by Meter Audit

...s down to ½ of 1%?

Such control was pioneered by Neptune Meter Company, over ten years ago. Out of this experimental work grew—

1. ***The RED SEAL Meter-Master System.***
2. ***The RED SEAL Meter-Master Stock Record System for Bulk Plants.***



3" Red Seal Meter equipped with Horizontal Straight Reading Register, Model 158. Note the weather-proof over-all hood for the register, and the hinged dial cover, designed for easy cleaning. Maximum flow, 300 gallons per minute; minimum, 20 gallons per minute.

Metering Records True Receivals—which thus can be checked against invoices. Efficient meters, with their appropriate accessories, also prevent excess air from being pumped into the storage tanks, there increasing evaporation with consequent loss of valuable light ends.

The meters here shown in a typical pit installation, are used in bulk plant service for unloading barges. Four 3" RED SEAL Meters with Horizontal Straight Reading Registers (Model 158) and Neptune Tank Air Release Valves are employed.

NEPTUNE METER CO.

...ORAGE TRANSFERS • LOADING RACKS • DELIVERY TANK TRUCKS • GASOLINE DISPENSING PUMPS

...ERED SEAL METERS

1567

ADVERTISING PAGES REMOVED

up. Next day, this is reversed and the friend's car left at the station for servicing.

Chrysler Corporation now employs 80,000 workers at all its plants. And approximately 75% come to work in their own or friends' automobiles.

Packard Motor Co. is building a new plant on eastern edge of Detroit to manufacture Rolls-Royce airplane engines. About 15,000 men will work in the new plant, as compared with 8000 in the present plant. The transportation picture has changed since Packard worked on government contracts in 1917-18. In the last war, 70% of Packard's employes lived within walking distance of the plant or came by street car. Now, 70% come to work in automobiles, with some commuting 40 miles a day.

FORD Motor Co.'s huge plant at Dearborn, a western suburb of Detroit, now employs 80,000 workers. Most of them use automobiles, despite streetcars and bus service available. There are 27 parking lots at the Ford plant, covering 87 acres and providing space for 16,675 cars. Because the plant runs 24 hours a day, the lots handle on the average 27,500 cars daily. Largest lot averages 9674 cars every 24 hours. In addition, the plant has 5650 other parking spaces nearer the plant buildings for officials, foremen and crippled employes.

Ford is building a $21,000,000 plant to make Pratt & Whitney airplane engines. Inside a board and tar-paper shelter, construction work was carried on 24 hours a day through the winter regardless of blizzards outside. It is nearly completed now and will provide employment for 10,000 men. Volume output is expected to be reached in August on an order totaling $122,000,000.

Besides this, Ford has another $11,000,000 plant under way at Ypsilanti, west of Dearborn, which will make bomber assemblies and parts for shipment to assembly plants planned for Tulsa and Fort Worth.

General Motors will provide similar assemblies for a plant being built at Kansas City, Kans. Chrysler with Goodyear will do same for a bomber assembly plant going up at Omaha. Briggs and Murray, body building companies, and Hudson Motor are also tooling for aircraft work.

Impact of these defense activities on the labor market will not be felt until late summer and fall. But the magnitude of these plans—the hiring of 100,000 men from the Detroit area—has caused some gasoline dealers to say, "The worst is yet to come." Refiner suppliers are preparing to help their dealers all they can by intensifying merchandising programs to sell "plus-profit" items and lubrication this spring and summer, thus bringing in more operating revenue to meet increased labor costs.

One jobber has taken on a line of accessories, anti-freeze, batteries, spark plugs, 2 brands of tires and a Pennsylvania motor oil—all nationally advertised products, and will wholesale them to his dealers. Besides whatever profit there is in it for him, this jobber feels that, by distributing these items to his outlets and working with them personally, he can improve his dealers' merchandising efforts—and their profits—more than if the dealers bought them through some other supplier.

Getting in on the "ground floor" is one way of cashing in on a defense plant located in the neighborhood, according to one enterprising Detroit dealer. When he heard that a certain manufacturer was going to occupy a new factory—"only a $2,000,000 plant"—near his station, this dealer went to the purchasing agent and "sold" him on the idea of servicing the company's trucks. Now, he has the company's business and much of the employes' trade. His lube jobs are running about 300 a month, gasoline gallonage up 30%. One day recently he got a hurry-up call to wash 40 cars from the plant by the next morning. He had 2 car washers and handled the job on schedule.

Some dealers complained that their customers had plenty of money these days but because they were working overtime in industrial plants they didn't have much time to drive their cars or else were too tired. So, gallonage wasn't up at their stations. But the silver lining to this was that larger pay checks meant the customers were more easily persuaded to keep their cars in good condition by regular lubrication, oil change and other needed services as well as buying tires, batteries and other accessories.

MOST of the 6 major companies contacted in the Detroit area said they are engaged in a program of turning loose low-volume outlets and concentrating on larger stations and the improvement of stations with good potential. For some companies this includes the building of stations at new sites in sections where there is a good flow of traffic and much residential construction.

Dearborn and the western section of Detroit north of this industrial area is an example of this. Gallonage increases of 25% and better appear quite general. Along the main arteries leading from the Ford area and other plants are several stations recently opened or under construction. Others on these routes are being improved and enlarged.

Indicative of the trend to larger stations are the facts recently brought out about one major company operating in Detroit. This company has 466 outlets in Detroit and its monthly average gallonage through service stations for the year 'round is 6,500,000 gals. per month or an average of over 14,000 gals. per outlet monthly.

Several dealers with volume normally in the 25,000-gal. bracket said that

TEN PUMP ISLANDS at this recently-remodeled station is basis for its claim to be "the world's largest gasoline station". It is built in a semi-circle, running through to the next street. Location is at Oakwood and Schaefer roads, just south of Dearborn industrial area

that ain't hay!"

Development of high compression tractors helps sale of millions of dollars' worth of petroleum products to expanding farm market.

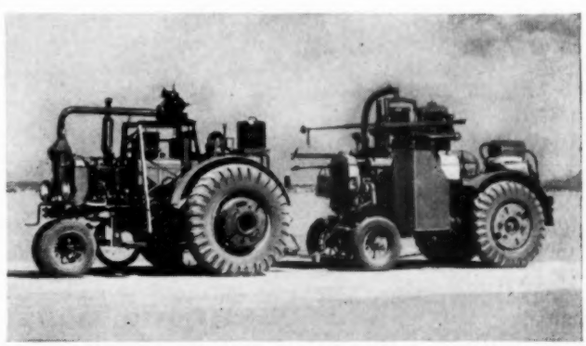
THE APPETITE of the average farm tractor for petroleum products equals that of two and one-half automobiles. Engineers and marketing experts estimate that the next five years will see a million more tractors on farms—a *billion* more gallons of gasoline added to the annual farm consumption of motor fuel—and, figured in dollars, "that ain't hay!"

This continued expansion of the farm market can be credited to the development of modern small high compression gasoline-burning tractors that make possible the mechanization of small farms. With high compression engines designed along automotive lines to utilize today's good gasoline, they give the farmer a powerhouse on wheels that can handle a great variety of farm jobs, both in the field and on the belt.

Tractor improvements have been the direct result of cooperative research by the petroleum and automotive industries. And from the beginning, Ethyl service engineers have worked hand-in-hand with both industries.

Today, in the Ethyl laboratories at Detroit and San Bernardino, Ethyl engineers are continuing to contribute to this progress through further experiments with engines of higher compression ratios and possible future fuels. At the same time the sale of modern, high compression tractors is being stimulated by Ethyl service engineers in the field and by a powerful national advertising campaign in farm publications. For the more attractive the tractor can be made to the average farmer, the more rapidly the farm market for petroleum products will expand.

Ethyl Gasoline Corporation, manufacturer of anti-knock fluids used by oil companies to improve gasoline.



THE BETTER THE TRACTOR, THE BIGGER THE FARM MARKET. Typical of the many research activities of the Ethyl laboratories is this field test of horsepower and fuel economy. Ethyl research and service work is conducted in cooperation with tractor manufacturers and oil refiners.

ETHYL

Better and more economical operation through

ETHYL RESEARCH *and* **SERVICE**

CONSTRUCTION of this $21,000,000 Ford plant at Dearborn continued 24 hours a day through the winter, with a tar-paper and board "overcoat" sheltering the workers from the weather. When completed this spring, plant will turn out airplane engines for Army. As indicated by parked cars, the private automobile is chief means of getting workers to the job

increased business made it look like they would need another man. Instead, they have pitched in and are doing their share of the station work and finding, they said, that in addition to avoiding the need for hiring another man, the station is now better managed with them closer to its operations.

Question of higher labor costs at stations has prompted the Retail Gasoline Dealers Assn. of Michigan to "do something" about obtaining a larger retail margin—but not through suppliers reducing tankwagon prices, according to Rankin Peck, executive-director of the association which has headquarters in Detroit.

"Our retail margin here now is 3.3c due to enforcement of the Michigan law prohibiting sales below cost," said Mr. Peck. "We made a survey of the retail cost of selling gasoline, alone, and found it to be a minimum of 3c per gal. The courts have accepted that 3c cost as the basis for prosecuting stations selling at less than that margin. Of course, we have had some trouble due to a few large retailers getting a 'discriminatory' price from their suppliers and then giving discounts. But the Federal Trade Commission's action under the Robinson-Patman law will clear up whatever remains of that practice."

Mr. Peck said that the dealers' association would soon launch a statewide survey of costs of retailing gasoline. Lowest cost of the most efficiently-operated station in each area will be adopted as "cost" for purposes of the below-cost selling law, he added. In view of higher wages and other increased overhead, Mr. Peck expects that for Detroit the minimum "cost" will be 3.5c as against 3c now (based on previous survey).

Part of the association's program also is to obtain enactment of Senate Bill 186, now pending in the Michigan legislature, to strengthen the below-cost selling law. Purpose of the revised statute, known as the "Motor Fuel Fair Practices Act," was described in a bulletin to association members. It read, in part, as follows:

"It (the law) prohibits a dealer from selling below his operating cost only when it is done with the intent to injure and destroy competition—it permits any dealer to meet the legitimate cost of the most efficiently-operated station—it provides that a Cost Survey shall be prima facie evidence after the Circuit Court certifies to the Survey's sufficiency. It does not prevent a defendant from establishing that he has developed new and more economical methods that enable him to decrease the minimum determined by the Survey. It also prohibits 'unjustified' price discrimination by a supplier to his retail dealers which is obviously unfair and has long been used as a short cut to monopoly."

Co-op Oil Associations Get 10.6% of Shipments Going into Minnesota

Minnesota's co-operative oil associations received 83,183,000 gals. or 10.6%, of the total gallonage of "light oils" shipped into the state in 1939, according to E. Fred Koller, assistant professor, division of agricultural economics, University of Minnesota.

Oil shipments into Minnesota in 1933 were 31,124,800 gals., or 6.1% of the total handled co-operatively. Inshipments in both 1933 and 1939 include gasoline, kerosine, distillate and other motor fuels, Mr. Koller says.

Southwestern and west central counties in Minnesota showed the highest proportion of "light oils" distributed by co-operative in 1939, report says.

Explaining the volume expansion of Minnesota's oil co-operatives, Professor Koller says:

"Among the more important factors accounting for the expansion in the volume of business of co-operative oil associations in Minnesota are the substantial savings which these organizations have effected for their patrons. In some of the years of the 1920's and early 1930's for which studies of the net income of large numbers of oil associations are available, these net returns have averaged as high as 10 and 11% of sales.

"However, in recent years gradual reductions in the gross margins obtainable in the handling of petroleum products have been a factor in reducing the net income of these organizations. The 1939 net income of a group of 92 associations selected from all parts of the state averaged 6.39% of net sales, which is a substantial net return but is the lowest in recent years.

"The 1939 net income of individual associations varied from a high of 13.89% of sales in one association to a net loss of 4.14% in another. Seven of the 92 associations showed net income in excess of 10% of sales.

"A comparison of the average operating statements of 92 identical Minnesota oil associations for 1938 and 1939 reveals the difference in operations giving rise to the lower net returns in 1939 (Table 1). It will be noted that the average dollar sales in the 2 years were about the same, $69,785 and $69,627, respectively. Likewise the cost of sales and the resulting gross margins were about the same in the two years.

"The average operating expenses in the 2 statements, however, showed an important difference, having risen from $11,575 in 1938 to $12,311 in 1939, or from 16.59% to 17.68% of sales, respectively. This change accounted for most of the decline in the average net income between 1938 and 1939. It is a change to which oil association managers and directors need to devote increased attention, if the net income of these organizations is to be held near the high level of former years."

Following table shows list of the 12 individual counties in Minnesota having the largest proportions of light oils hauled by co-operatives:

Table 1. Average Operating Statements of 92 Minnesota Oil Associations, 1938 and 1939

Item	1938 Average of 92 assns.	1938 Per cent of sales	1939 Average of 92 assns.	1939 Per cent of sales
Sales	$69,785	100.00	$69,627	100.00
Cost of sales	53,758	77.03	53,648	77.05
Gross margin	16,027	22.97	15,979	22.95
Operating expense	11,575	16.59	12,311	17.68
Net operating income	4,452	6.38	3,668	5.27
Other income	685	.98	794	1.14
Total	5,137	7.36	4,462	6.41
Other expense	122	.18	13	.02
Net income	$ 5,015	7.18	$ 4,449	6.39

Table 2. Proportion of Light Oil Inshipments by Co-operative Associations in 12 Leading Counties, 1939

County	Per cent of inshipments by co-operatives	County	Per cent of inshipments by co-operatives
Kanabec	69.2	Red Lake	33.7
Clearwater	49.9	Isanti	33.4
Roseau	40.9	Brown	33.2
Grant	39.6	Yellow Medicine	31.8
Nobles	38.5	Lyon	31.8
Nicollet	37.1	Carlton	31.5

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SHELL

New Spring Change-Over Services Required on Many 1941 Cars

SPRING Change-Over will find many of the sleek 1941 model cars rolling into oil company stations for their first extended servicing. Beneath their shiny exteriors are new features requiring the attention of the station operators, starting with hood locks controlled from the driver's seat.

Sound reasons why the owners of these cars should give particular attention to their spring conditioning, and suggestions for performing the services, are given in the owner's manuals put out by the car manufacturers. The manuals tell why crankcases should be flushed out when the oil is changed. They give good pointers for selling owners on:

Changing gear lubricants in the spring, even though the recommended interval between changes, on a mileage basis, has been extended, to 15,000 miles for one line of the new models.

Flushing rear axle and transmission housings with the proper oil when the lubricant is changed.

Cleaning the oil-bath type of carburetor air cleaner, which is standard equipment on many of the 1941 cars, and optional on all lines.

Cleaning spark plugs and adjusting points, as a part of spring servicing.

The 1941 manuals are addressed to the owners of the latest model cars, but the recommendations for changes of crankcase oil and gear lubricants, and Change-Over servicing of other points on these cars, apply equally well to the models of late years in general. These cars have been built with higher compression ratios, with greater engine speeds, with hypoid gears in their rear axles in many cases; all of which features impose more severe operating conditions on the lubricants. One motor car manufacturer (Nash) uses these words to impress on the owners of its new models the importance of seeing that the engine secures proper lubrication:

"With the parts moving in clearances of less than one thousandth of an inch, and with the tremendous pressures built up by modern, high compression design, your engine creates terrific heat, enough to warm a fair sized home in the dead of winter."

Sales points for changes of lubricants in the 1941 and other late model cars and suggestions for servicing, which oil company stations can use to aid them in selling Spring Change-Over servicing, are as follows, as taken from the latest car manuals:

Changing Oil—Flushing Crankcase

Studebaker: "Short runs in cold weather with frequent stops and starts, as is the habit of doctors and city salesmen, increase the possibility of crankcase dilution, because the engine does not reach normal operating temperature.

"Extreme cold weather prevents the expulsion of fuel vapors that find their way into the crankcase and which, as a result, condense inside the crankcase proper. These fuel vapors are a product of combustion and are composed of gases which, if allowed to condense, may be very harmful to the internal parts of an engine.

"The crankcase should be cleaned regularly, at least once a year, preferably at the time winter oil is replaced with summer weight oil."

Plymouth: "The engine oil is subjected to dilution and contamination by water, fuel acid, and other foreign elements which reduce the lubricating qualities of the oil. Accumulations of non-lubricating elements have a damaging effect on highly finished metal surfaces. Fuel thins the oil, reducing its value as a lubricant. Water has no lubricating value, and is likely to freeze, thus causing a stoppage of the oil circulation. Acid attacks metal surfaces, causing excessive wear. All of these adulterating surfaces tend to form more rapidly as the temperature goes down."

The Plymouth manual warns against using kerosine for flushing out the oil pan (crankcase) and lubricating system. "A certain amount will remain in the system, collecting in pockets from which it cannot be drained, and will dilute the oil," it states.

Chevrolet: "Serious lubrication troubles may result in cold weather by an accumulation of water in the oil pan. This condition as a rule is little understood by the car owner.

"A slight amount of the exhaust gases pass the pistons and rings, even under the most favorable conditions, and cause the formation of water in the oil pan, in greater or less degree, until the engine becomes warm. When the engine is thoroughly warm, the crankcase will no longer act as a condenser and all of the gases will pass out through the crankcase ventilator system.

"Practically all present-day engine-fuel contains a small amount of sulphur which, in the state in which it is found is harmless; but this sulphur, on burning, forms certain gases, a small portion of which is likely to leak past the pistons and rings and, reacting with water, when present in the crankcase, form corrosive acids."

"As long as the gases and internal walls of the crankcase are hot enough to keep water vapor from condensing, no harm will result; but when an engine is run in low temperatures, moisture will collect and unite with the gases formed by combustion; thus acid will be formed and is likely to cause serious etching or pitting.

"This etching, pitting or corrosion, when using fuel containing considerable sulphur, manifests itself in excessively rapid wear on piston pins, camshaft bearings and other moving parts of the engine."

Oldsmobile: "As the power and speed of engines have increased, a greater need has developed for better lubrication that will positively protect the hundreds of tight-fitting and fast-moving engine parts. Short runs in cold weather, as in city driving, do not permit thorough warming up of the engine and water may accumulate in the crankcase, which promotes rusting and may cause clogging of oil screens and passages."

Grade of Oil Selected By Temperature Ranges

Both oil companies' and car manufacturers' recommendations for the proper grade of crankcase oil, for refills after draining the crankcase, are now all based on atmospheric temperatures at which it is anticipated the car will be driven.

"The oil should be selected not on the basis of the atmospheric temperature at the time of change, but on the anticipated minimum temperature for the period during which the oil is to be used," says Oldsmobile. "Otherwise, difficulty in starting is apt to be experienced at each sudden drop in temperature, and the efficiency and economy of the engine are apt to be impaired."

Some manuals caution owners to

WHEN a customer buys gas from you and oil from someone else, you've got only half a customer.

What's the point of cutting customers in two? Why not sell them the motor oil they want, so you will have all their trade?

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use only oils produced and distributed by reputable oil companies. "The refiner or marketer supplying the oil is responsible for the quality of its product," says Buick. "Their reputation is the car owner's best indication of quality."

Seasonal Change of Gear Lubricants Is Advised

While the mileage interval between recommended changes of rear axle and transmission lubricants has been extended for some models to 15,000 miles for one line and some manufacturers recommend the same grade of lubricant for year-around use, most of the 1941 manuals recommend the gear lubricants be changed spring and fall.

Where inspection shows additional lubricant is needed to bring it to the proper level, the universal recommendation is that the lubricant be entirely renewed, rather than adding fresh lubricant to that already in the housing.

Flushing the housings when gear lubricants are changed is also recommended for all the new cars, most of which have hypoid axles. Only flushing oils should be used, is the warning given—never steam, water, gasoline, kerosine or alcohol. The recommendations in some 1941 manuals for servicing rear axles and transmissions are as follows:

Ford:..In the spring, or after 5000 miles, whichever comes first, drain, flush and refill with the recommended gear oils.

Chevrolet: "While seasonal changes of rear axle and transmission lubricant are not required, it is recommended that you have the housing drained and refilled with the recommended lubricant twice a year, or every 6000 to 10,000 miles." Owners are cautioned to see that only a light flushing oil is used.

Plymouth, Chrysler, Dodge and De Soto recommend changing rear axle and transmission lubricants at 15,000 miles. However, regarding rear axles, their manuals state: "Drain, flush with flushing oil and then fill with grade of lubricant specified. Because different brands of gear lubricants have different characteristics, never mix one brand with another.

"If necessary to add lubricants to maintain the high level, it is best to drain, flush and refill."

For the standard transmissions on these cars, draining, flush and refilling after 15,000 miles is recommended.

Oldsmobile advises draining and refilling the rear axle in the spring. In addition to seasonal changes, draining is advised at 10,000 miles if the car has been driven long distances at high speeds.

Studebaker manuals call for draining, flushing and refilling rear axle every 10,000 miles, "with a Studebaker hypoid lubricant, or any hypoid lubricants manufactured by a reputable oil company." It is stated further: "Do not, at any time, mix various brands of hypoid lubricants. If the brand is changed, it is absolutely necessary to drain and flush out the rear axle housing before installing the new lubricant. Be certain this is thoroughly done. Use light engine oil for flushing."

Nash says the rear axle should be drained, flushed and refilled with approved hypoid gear lubricant every 10,000 miles. "It is advisable to check the level every 2000 miles," it adds. "If the level has dropped, due to leakage, the lubricant should be changed completely. Never add lubricant, or mix one brand with another."

The Nash manual recommends that the transmission and cruising gear be drained, flushed and refilled in the spring, as well as after 10,000 miles.

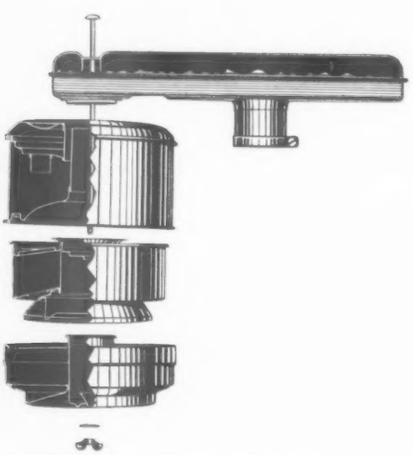
Buick: "Drain, flush and refill; in no case should the transmission and rear axle lubricant be used for more than 10,000 miles."

Recommendations of oil companies and car manufacturers for servicing the new fluid drive and transmission used by Chrysler, De Soto and Dodge, and the hydra-matic drive, which is optional on new model Oldsmobiles and Cadillacs, are that this work be referred to the car dealer.

Oil-Bath Air Cleaners Used on More '41 Models

Importance of servicing the air cleaners that filter air going to the carburetor is emphasized in all the manuals. This is included by many oil companies in their Spring Change-Over servicing. More of the 1941 model cars have replaced the wire gauze type of filter with the oil-bath type, which requires filling with 1 pt. of motor oil, after the filter has been cleaned.

Oil-bath type cleaners are standard equipment on the 1941 Plymouths and on Buick, Chrysler, De Soto, Dodge and most Packards. The wire gauze type is still standard on Chevrolet, Ford, Hudson, Nash, Oldsmobile, Pontiac and Studebaker. However, on all these makes, the installation of the oil-bath



Types of oil-bath air cleaners used on 1941 Chevrolet and Buick models. The photograph shows the cleaner used with compound carburetors, the drawing is the cleaner used with single carburetors, disassembled. In the drawing the bottom chamber holds the oil; the top chamber has a wire gauze filtering element, through which the air passes, as well as through the oil bath

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A 1941 FORD TRUCK does a big day's work because it:

★ Is *built* for hard work from the *inside out.*

★ Has more horsepower (95) than any other low-priced truck—delivers high torque over a wide range of road speeds.

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FORD CAB-OVER-ENGINE TRUCKS *maneuver easily in traffic and crowded loading spaces and alleys. Wheelbases of 101", 134", and 158" accommodate standard and special bodies . . . give large payload space with short over-all length.*

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type is optional and recommended where the car is operating on gravel or dusty roads.

Recommendations vary as to how often the oil-bath cleaners should be serviced. Buick says to clean every 10,000 miles. Most car manufacturers say operating conditions in the individual case should determine the frequency. In most cases SAE 50 grade motor oil is recommended for refilling, for summer driving. Others recommend using the same grade of oil as in the engine, recognizing that many stations do not stock SAE 50 grade, as it is not required for crankcase oil. For use in air cleaners in winter, manufacturers' recommendations vary from SAE 20W to SAE 50 grade.

Oil company stations clean the oil-bath air filters for 25c, the same price they get for the wire screen type. In addition, some stations charge 10 to 15c for the pint of oil to refill it. Chevrolet's manual says the servicing of this type of cleaner is an important operation and describes how it should be done, after the cleaner has been removed from the carburetor:

"Empty the oil out of the cleaner and clean out all accumulated dirt. Wash body with clean gasoline and wipe dry. Wash filter element by slushing up and down in clean gasoline. Dry thoroughly, either with an air hose, or by letting it stand until dry. Fill the body of the cleaner with 1 pt. of oil of not less than SAE 50 viscosity in summer and lighter grades in winter. It is not necessary to re-oil the filter element, as this is done automatically when the car is driven."

The Studebaker manual states that the refilling of the cleaner should be by pouring the oil through the filter element, distributing it over the element, and then allowing about 15 minutes for the oil to drain through the filter into the reservoir before starting the engine.

"The oil film on the filter element collects the dust particles and is vitally necessary to the efficient operation of the cleaner," the manual states.

The wire gauze type of air cleaner is to be serviced at not over 2000 miles and as frequently as every 500 miles, if the car is driven on dusty roads. In some of these cleaners, the filter element is removed for cleaning, in some the entire cleaner unit. In either case, the filter element is dipped in solvent or kerosine and dried, after which it is dipped in engine oil, then reinstalled.

Adding Rust Preventive Made Part of Radiator Servicing

Good arguments for extending radiator servicing to include adding rust inhibitor, as well as draining antifreeze and cleaning out, are given in the new car manuals. Oil company stations that supply rust preventive get up to $1 per car. When only the radiator is drained and cleaning compound added, the charge is up to 35c at many places.

Emphasizing the importance of radiator service with Spring Change-Over, is the following comment from the latest owner's manuals:

Ford: "To aid in keeping the water neutral, the use of an inhibitor (2 oz. can) is recommended in all cars and trucks. This is especially advisable where alkaline, acid, or saline waters are likely to be encountered. In cars equipped with aluminum cylinder heads, an inhibitor is even more important, due to the corrosive action of alkaline water on this metal."

Studebaker: "The action of lime and other minerals present in many kinds of water leads us to recommend that 1 pt. of an approved inhibitor be added to the cooling system, after draining. This will help protect the entire cooling system (radiator, cylinder block and head and water pump) from any chemical action such as calcination within the radiator core and consequent stoppage of the passages."

Hudson: "Use of rust and corrosion inhibitor in the cooling system, after draining in the spring, will assist to a large measure in keeping the system clean and permit efficient circulation."

Nash: "The cooling system should be protected with a good rust and corrosion preventive used at least once every 6 months, or when the system is drained for the winter and summer Change-Overs. Chemicals in the water in some sections may damage the cooling system unless certain simple precautions are taken."

Buick: "Strongly recommend use of rust preventives. These coat the metal surfaces in the cooling system, thereby preventing rust and corrosion, which would decrease cooling efficiency and result in plugging of radiator core."

The Same Amount of Oil Carries Heavier Load in Today's Engines

Why particular care is necessary to insure that the oil used in recent model cars is in suitable condition to protect the engine, is shown in the significant engineering data in the table below, which compares 6 and 8-cylinder models of 8 lines of cars made in 1931 and 1941.

While the engines of today are of the same size and call for the same amount of crankcase oil for their lubrication, even less in a few models, the average horsepower of the engines of today has increased 51%. Developing this increased power means that more heat is generated in the cylinders, which reaches the crankcase via the cylinder walls and from the piston rods.

Contributing to the 51% increase in horsepower are higher compression ratios, more revolutions per minute (higher engine speeds) and greater piston displacement per cubic inch, among other factors. The data in the table was presented in a paper by R. J. S. Pigott, Pittsburgh, Gulf Research & Development Co., before the annual meeting in January of the Society of Automotive Engineers.

Since this paper limited its discussion to engines, it did not bring out the general adoption of hypoid gears in rear axles of passenger cars the past few years. This has greatly increased the pressure on gear teeth and imposed more severe operating conditions on differential lubricants; making the draining, flushing and refilling of the rear axle housing an important part of Spring Change-Over servicing of recent model cars.

Hoods on the 1941 Models Unlock from Driver's Seat

Hoods on most of the 1941 cars, before they can be opened by station operators for Change-Over servicing, must be unlocked by a control in the driver's compartment. On all these cars but Nash, the battery is under the hood.

Below are listed the cars where the hood is unlocked by pulling a control knob to the left of the steering column, on the lower flange of the instrument panel. This allows the front end of the hood to be raised slightly, then the operator, with his fingers, releases a safety hook, which prevents the hood being blown open while the car is in motion:

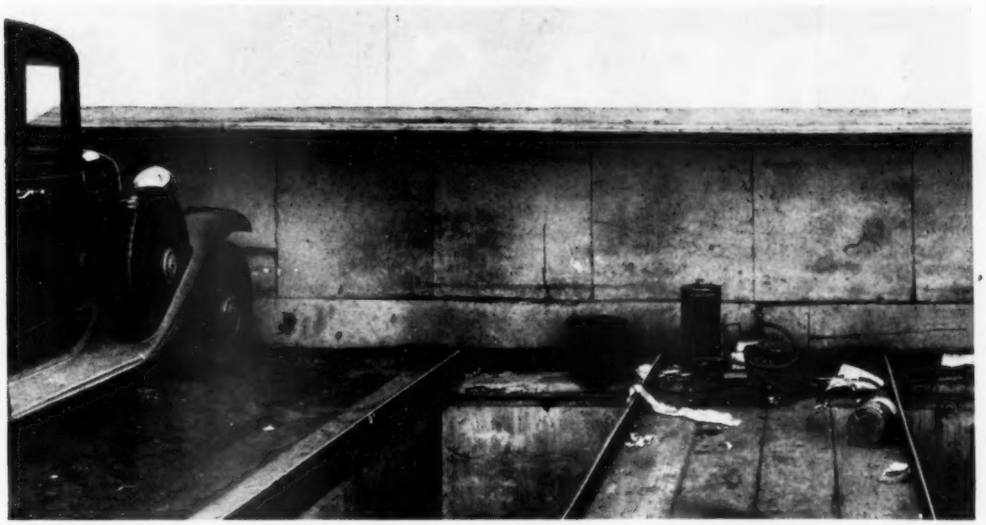
Chevrolet	De Soto	Ford
Lincoln	Mercury	Nash
Oldsmobile	Plymouth	Pontiac
Studebaker	Willys	

Engineering Data Compared on 1931, 1941 Automobiles*

Car	Compr. Ratio	Horse Power	Rev. Per Min.	Cu. In. Piston Displace.
		1931		
Buick 50	4.75	77	3200	220.7
Chrysler 8	5.3	88	3400	260.8
Dodge 6	5.2	68	3200	211.5
Oldsmobile 6	5.06	65	3350	197.5
Studebaker 6	5.2	70	3200	205.3
Cadillac 8	5.35	95	3000	353.0
Nash 8	5.25	87.5	3400	240.0
Chevrolet 6	5.02	50	2600	194.0
Average for 1931	5.1	75	3170	235.3
		1941		
Buick 50	7.0	125	3800	248.0
Chrysler 8	6.8	137	3400	323.5
Dodge 6	6.5	91	3800	217.8
Oldsmobile 6	6.1	100	3400	238.1
Studebaker 6	6.5	94	3600	226.2
Cadillac 8	7.25	150	3400	346.3
Nash 8	6.3	115	3400	260.8
Chevrolet 6	6.5	90	3300	216.5
Average for 1941	6.65	113	3500	258.4
% Increase from 1931	+30%	+51%	+10%	+10%

*From paper by R. J. S. Pigott, Gulf Research & Development Co. Limited to cars that made sixes and eights in both years.

INTELLIGENCE TEST:



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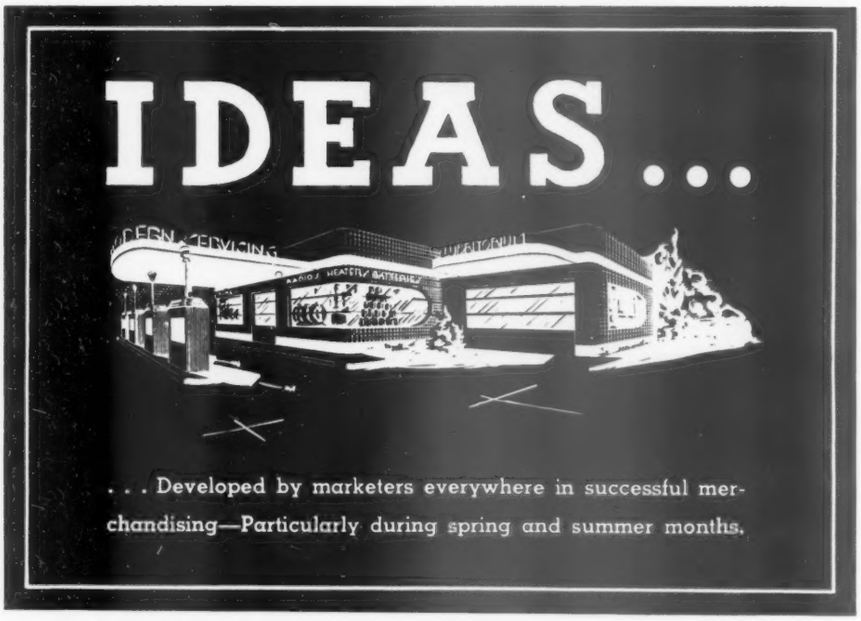


In the spring an oil man's fancy lightly turns to thoughts of—IDEAS that will bring a share of the long green bills into his till.

This year, the good old greenbacks are more plentiful than ever, (due to the defense program) but with a mild winter—except for the St. Patrick's day blizzard—and with operators drafted or hired by defense projects, it may be doubly hard to corral these greenbacks.

So the marketer who does the best job of educating his dealers to merchandise their products and services in the 1941 Spring Change-Over business battle, is the marketer most likely to be the "fair haired boy from Memphis" at the bank's receiving window. And back of good merchandising for any marketer are IDEAS.

Clean Air Filters

MARKETERS these days are so busy that one of their greatest problems is to find time to sit down long enough to remember what they already know.

The purpose of this article is to put in small capsules, marketing "dope" which can pass on to stations and dealers. Some of these ideas will be old to some marketers—things they do without thinking. Some of them will bring back ideas that were successfully used in the past and forgotten. Others will be new.

But all of the "capsules" have obtained good results for marketers. And that is what counts.

ACCESSORIES

He Gives Them a "Line".

One marketer furnished his stations and dealers with signs reading "OUR SPRING LINE OF ACCESSORIES". He suggested that dealers secure a clothes line and string it where customers would see it. Hung on the line were various small accessory items such as wiping cloths, spark plugs, oil filters, home lubricant and other small items. It worked!

AIR FILTERS

Two-bits—mostly velvet

Since all new model cars, except Austin, are now equipped with an air filter, an air filter cleaner is almost a necessity for a service station. One marketer found that a sign at the AIR STAND reading "AND DON'T FORGET AIR FILTER SERVICE" led to the sale of hundreds of these profitable 25c jobs at his own and dealer's stations.

BATTERIES

Well displayed—half sold.

Spring inspection usually finds a few shelf-worn batteries. Some marketers may want to follow the plan of one supervisor who had tank truck drivers wipe them with a cloth, dampened with some light motor oil. To keep them looking fresh, they were wrapped in cellophane which was held in place with a rubber band.

CLEANERS, POLISH, WAX

Dolling up for the week end.

A prominent display of car polishes, waxes, furniture polishes and cleaning cloths always leads to plus sales, particularly in spring. One marketer found that Friday was the day to feature these particularly. Folks want to "doll" their cars up before going on week end trips. Trailer tourists are big furniture polish users.

FAN BELTS

Neck out pays—if

They are both old stunts, but they still work for many marketers: 1. Carrying a fan belt around the neck

Dramatize Battery Service

Defense Drive Makes Lubrication Problems Stiffer

GET EXPERIENCED COUNSEL FROM THE "S.O.S." MAN!

TODAY AMERICAN INDUSTRY rushes full speed ahead on the greatest production drive in history!

Plants long idle are working three shifts a day. Everywhere is the hum of machines being pushed as never before—being driven at capacity 24 hours a day to make America strong, to keep America safe.

This unprecedented pressure means new lubrication problems for jobbers and compounders. For the lubricant that was more than good enough yesterday may not measure up to the exacting demands of today.

Right now is a good time to call on the experienced counsel of the Gulf "Stock Oil Service" man. Problems that call for stock oils and greases to take the punishment of three-shift production schedules are old stories to him.

When you need the right answer in a hurry, send for the Gulf "S.O.S." man.

Gulf's line of mid-continent solvent refined Paramid neutrals and Bright Stocks; acid-treated Rodessa neutrals; solvent refined Paratex oils, and acid-treated coastal oils offer a wide range to meet your specifications.

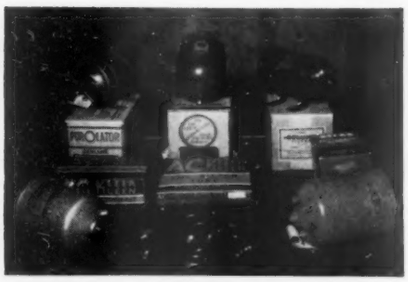
Write or wire for samples and specifications.

GULF OIL CORPORATION
2500 GULF BUILDING

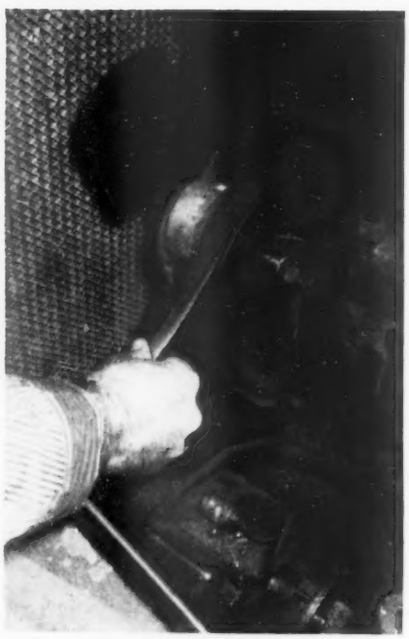
GULF

GULF REFINING COMPANY
PITTSBURGH, PA.

Display Oil Filters



Check Fan Belt



Push Spark Plug Sales

to create interest, desire and action. 2. Registering amazement when customer informs operator that he doesn't carry a spare fan belt.

FUSES

They're little, but important—and profitable, too.

A fuse is as important as Gertie's shoulder strap. An accessory-minded marketer suggested to his operators that every customer, particularly regulars, coming in be asked if he had a box of spares in case of trouble. Most didn't and most bought a box.

OIL FILTERS

Midnight black on white enamel.

A major company experimented with the best way to display an old oil filter with a cut-away view to show motorists what it means to operate a car without proper filtration. It was found that a white enamel pan produced twice as much attention as other methods of using this silent salesman.

SPARK PLUGS

Grease drums sell spark plugs.

Says one marketer: "I provided my stations and dealers with empty 100-lb. grease drums, neatly painted, on which there was a sign reading "DO YOUR PLUGS BELONG HERE". Old plugs were placed in the drums. This plus free testing service and spotting old plugs while checking the oil brought a "land-office" plug business. Profitable, too.

LIGHT BULBS

A new light on an old subject

A southern marketer found that when his dealers asked customers to turn on their lights in the day time to check for bad bulbs it sold more light bulbs. But many of his operators grew careless after 2 or 3 weeks. So now in his monthly bulletins to operators he shows the nunmber sold by each station. This competition keeps operators on their toes, and sells many extra bulbs.

TIRES

All is not what it seems.

There are hundreds of tire selling plans. One marketer found that the reason many customers bought from regular tire stores was because they had a bigger assortment to choose from. For smaller stations not carrying large stocks, old tires were rewrapped and placed in big piles around the air stand and where customers would be impressed with the large stock carried.

WINDSHIELD WIPERS

It looks like rain.

One chain of stations during the rainy season paints a section of a display window with white chalk and rigs up a wiper with a motor operated with a battery which sweeps a clear spot on the window. This moving display attracts attention, sells blades. Another

Inspect Light Bulbs

Replace Worn Wipers

Promote Change-Overs

BECAUSE AN EMERGENCY VALVE IS AN *Insurance Policy*

IT SHOULD BE CHOSEN WITH THE SAME CARE AS AN *Insurance Company*

You buy Emergency Valves for a specific purpose: to protect you against certain hazards to which all storage tanks are subject.

In that sense, an Emergency Valve is an insurance policy—and, like an insurance policy, should be chosen with this thought in mind: Can it be depended upon to *deliver* the required protection when called upon to do so?

And that leads directly to McDonald Emergency Valves.

For these valves are designed and built with a full sense of the responsible service they are to render. First and foremost, they are made to function positively and unfailingly in emergencies — with an EXTRA LONG, LARGE SPRING to avoid over-stressing. In addition, they embody the all-important feature of FULL FLOW. They have LARGE PORT OPENINGS, so positioned as to maintain full opening despite the fact that inside flanges may be used. There is NO DISTORTION OF SEAT—even when improperly tapped, tank flange necessitates extreme force in attaching valve. Available in these sizes: 2″ x 2″, 2″ x 2½″, 2½″ x 2½″, 3″ x 3″ and 3″ x 4″.

It goes without saying that McDonald Emergency Valves are approved by the State Fire Marshals of all states where such protection is required by law. For safety sake, insist on the extra protection of McDONALD Emergency Valves.

A. Y. McDONALD MFG. CO.
"The Home of the Swing Joint"
DUBUQUE, IOWA
There's a McDonald Branch or Distributor Near You

Plate 970 (Valve Closed)

McDonald Emergency Valve. Furnished plain without Hold-Open Device. May be operated by a cable with one or more fusible links to insure closing in case of fire near tank. Note: Same Hold-Open mechanism used in Plate 970-H can be furnished later, if desired, for easy attachment to Plate 970 in the field.

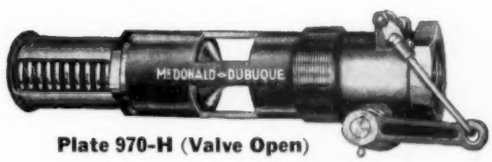


Plate 970-H (Valve Open)

Identical to Plate 970 except that it is furnished with a special Hold-Open Device which incorporates a fusible link to insure closing in case of fire. In this design, a steel hook engages the hole in the lever, insuring that the valve will be fully open at all times when so attached. Hook link is easily inserted for holding open—and easily released for closing.

McDONALD
EMERGENCY VALVES

STOCK THESE REPUBLIC PRODUCTS *for* QUICK TURN OVER

Are you losing sales because your line of motor oils is not complete? If so, contact a Republic representative and let him explain how you can cash in on every request for every grade of motor oil.

REFINING

Republic Oil Company operates its own refineries at Duval and Texas City, Texas, as well as lubricating oil blending and canning plants at Texas City, Coraopolis, Pa. and Hopewell, Va.

TERMINALS

Republic's extensive terminals offer unusual facilities for jobbers. More than seventy-five million gallons of petroleum products are available through Republic's terminal facilities.

SALES OFFICES: Benedum-Trees Bldg., Pittsburgh, Pa.; 3700 Leland Ave., Baltimore, Md.; P. O. Box 152, Wilmington, N. C.; P. O. Box 1987, Jacksonville, Fla.; P. O. Box 2425, Tampa, Fla.; 30 Rockefeller Plaza, New York..; 511 Union Trust Bldg., Petersburg ,Va.; P. O. Box 1161,'Savannah, Ga.; Second National Bank Bldg., Houston, Texas; P. O. Box 1222, Fayetteville, N. C.

TERMINALS

Pittsburgh, Pa. — Baltimore, Md. — Norfolk, Va.
Hopewell, Va. — Wilmington, N. C. — Savannah, Ga.
Jacksonville, Fla. — Fayetteville, N. C. — Tampa, Fla.
Corpus Christi, Texas — Texas City, Texas

REPUBLIC OIL CO.
BENEDUM TREES BLDG. PITTSBURGH PA.

Fog Lights—'Plus Profits'

"scheme" is a weather report sign reading, "RAIN TOMORROW, IS YOUR WIPER BLADE OK?".

WHEEL PACKS

'A horrible example'

Marketers who have made a success out of wheel packing in their stations often have a display of worn wheel bearings where they can be seen. Many attention getting signs can be worked out as part of the display. For instance: "SAFETY FIRST, WHEN WERE YOUR WHEEL BEARINGS SERVICED?"

OIL CHANGES

This year, many marketers will add to their oil change merchandising API's suggested technique of **"When the speedometer shows a thousand miles the motor may have run 500 more when the car was not moving."**

LUBRICATION

Profitable turnover in a different way.

In addition to regular merchandising of lubrication, marketers sometimes find that a "stunt" will stop them. One marketer with 12 stations in a town started his spring lubrication drive by having a car at each station turned over on its side on the driveways. Streamers were run from all lubrication points to the various lubricants required, which were displayed in their original containers in front of the car. Motorists stopped, looked and bought.

QUICK SERVICE

Oily rollers

For winter change-over stunt, a Cleveland marketer put its attendants

on roller skates. Much free publicity resulted.

AIR EQUIPMENT
Fresh country air—perhaps

Sounds trite. But one marketer advertised his latest air equipment. Invited people to come in and see how it worked. Created lots of interest.

RAIN INSURANCE
Betcha it doesn't rain.

Refunding price of a wash job if it rains in 12 hours still works for many marketers having wash facilities in their stations.

FILMS DEVELOPED
Develops Pictures.

One marketer got even with the drug stores selling station items by acting as film developing agents for a photographer. Pulled in a lot of extra customers.

HUB CAPS
A CAPital idea

Some marketers sell hub caps, and find that having them on display is about all there is to the selling job.

FLASH LIGHTS
Light on the belt.

A marketer suggested to his dealers that they hook a flashlight to the belt of every operator. Many sales resulted.

FLUSHING JOBS
Dramatize and sell

A Canadian jobber found that his biggest flushing oil customer used a magnet to show drain customers metal particles in their oil. Passed the idea along. Sales jumped.

TIRE APPROACH
Trading psychology

One company finds this the most successful tire approach: "By the way, Mr. Jones, we are buying all the used tires we can get in your size. We can allow you more for them this week than they're worth to you". This casual approach opens the subject to a tire sales approach.

WHITE SIDE WALL COATING
Black and white

Many marketers find that liquid rubber compound is an easy selling profit-

Sell Tail Pipe Extensions

How's your service
ON SPECIAL OIL BLENDS?

IF THE demand for rush blends of special lube oils, cutting oils, etc. hasn't hit you yet, it soon will. As defense production gets into full swing on a 24-hour basis, it will create demands that depend on two things: (1) the quality of the blend, (2) speed of delivery. That's where "LIGHTNIN" Mixers come in.

You never have to worry about quality with a "LIGHTNIN" Mixer. Take lube oil, for example. Blending bright stock and neutral is no cinch for a hand paddle or circulating pump. Pour point depressants make the job even tougher, but for your "LIGHTNIN" Mixer, the job is a snap.

Now as to economy and speed. For a three or four hundred gallon capacity, you can get a "LIGHTNIN" Portable for around $140.00 that blends perfectly in 15 to 20 minutes, leaving your operator free to get drums ready.

With "LIGHTNIN" Mixers, you enjoy the same speed and economies that refineries have enjoyed for twenty years. Here's how to get them. Give us your tank dimensions, batch size, what you are blending and let us quote you without obligation.

MIXING EQUIPMENT CO., INC.
1033 GARSON AVENUE, ROCHESTER, N. Y.

BOOST SALES by INCREASED QUALITY!

100% DEGUMMED CASTOR OIL OFFERS

you a brand new way to put "customer appeal" into your products and give them a definite "selling edge" on competition.

4 QUICK FACTS

1—Pawco Castor Essence will build greater car owner satisfaction for your products.
2—Pawco Castor Essence gives your product a natural metal adsorbing "oiliness."
3—Pawco Castor Essence supplies your product with a detergent against carbon, gum, engine-varnish.
4—Pawco Castor Essence gives your product an "exclusive" on which to build a sales increasing merchandising plan.

Oil men have long recognized and agreed that Castor Oil is the world's best lubricant—except for one thing, it gums up! But we have finally licked that big trouble!

Our exclusive "Paluszek Process"—the only castor degumming process—completely, 100% degums castor oil. This degummed Castor Oil Essence is a "Gum"-Fighter, "Carbon"-Fighter, "Engine Varnish"-Fighter, that has no equal.

100% Degummed Castor Oil will build into your fuels and lubricants new and appealing qualities, of particular importance for internal-combustion engines—both gasoline and Diesel. It definitely steps up "oiliness", spreading, and metal adsorbing abilities of lubricants with which it is blended. In fuels, it lubricates and provides a detergent against the formation of gum, carbon and engine varnish, thereby keeping compression rings and valves free.

Further details about this new and exclusive 100% Degummed Castor Oil Essence will be sent to you for the asking. And, a sample for your own experimentations . . . to give convincing, factual proof that here is the answer that will make your product stand aloof from competition . . . something you can really merchandise in a big way. Write Dept. E.

PAWLING REFINING CORPORATION

FOX ISLAND ROAD PORT CHESTER, NEW YORK

BULK PLANT OPERATORS—

SAID *"Build us a Truck Pump that is*

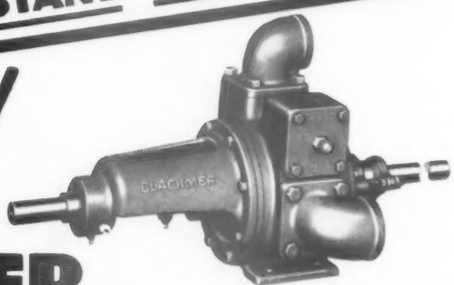
QUIET-SMALL SIZE-LIGHT WEIGHT

EASY TO MOUNT *and* **SERVICE**

and that will **STAND THE GAFF!"**

SO HERE IT IS—

the **NEW!**



BLACKMER

TRUCK PUMP

with **"BUCKET" DESIGN**

that automatically takes up wear

These features mean fast dependable deliveries:

Built-in non-chatter relief valve.
Triple bearings protected against pumpage.
Rotation in either direction.
New "T" type strainer.

Prompt delivery on all models for power take-off, gasoline engine and electric motor drive.

Write for Bulletin No. 100. It will show you new Truck Pump standards.

BLACKMER PUMP COMPANY

1884 Century Avenue, S. W. Grand Rapids, Michigan

Convince 'em It's Worn

able item to sell car owners for renewing the appearance of worn, scuffed, white sidewall tires. There is also a market for painting white sidewalls on black tires.

WAX AND POLISHING JOBS

Half-and-half

According to one marketer, many extra wax and polish jobs can be obtained by displaying as often as possible, a car only one-half polished.

DIRECT MAIL FOR LESSEES

Matching dealer's mailing campaign.

Some marketers have solved the problem of getting lessees or dealers to mail postal cards to prospects, by offering to send out as many each day as the dealer will send. High school boys and girls are employed to write the cards, signing the dealer's name. Many marketers have contests to keep dealers enthusiastic about mailing cards. Other marketers sponsor periodic breakfast parties for dealers to maintain a specified mailing schedule.

SEAT COVERS

Something to play with.

A marketer who did an exceptional job of selling seat covers furnished his dealers with swatches of the materials (furnished him by his supplier). "Gas" pump salesmen would hand several of these samples to customers to look at while the "gas" was being pumped. Many orders resulted.

FOG LIGHTS

An idea used by one marketer in his stations should work for any jobber selling fog lights. He suggested that stations rig up a couple of these with a battery and a switch near the restroom. Prospects can see how they work and are often sold without effort.

COOLING SYSTEM SERVICE

Oil companies are literally "cleaning-up" with flushing service. Particularly with power flushing equipment. Marketers find that the simplest and easiest way to sell this profitable service is to show their operators how they can take a clean cloth or paper napkin

and wipe out the muck at the top of the radiator fill pipe and show the customer his need for a radiator flush. One dollar for power radiator flushing, including the cleaning compound, is the usual cost. Some customers prefer to do their own flushing, and for them most stations carry solutions retailing at from 25c to 75c per can. Cooling system service leads to the sale of radiator hose. An inspection quickly shows hose deterioration.

Refining Ranks 5th In Industry Survey

WASHINGTON — Petroleum refining ranks high among nation's industries for its contribution to the American system of free private enterprise, according to Theodore J. Kreps, economic advisor to the Temporary National Economic (Monopoly) Committee whose monograph, "Measurement of Social Performance in Business," was recently issued.

Subjecting industry to 7 tests intended to show extent of this contribution, Kreps says, in his monograph, he found petroleum refining ranked fifth among 22 important industries.

Specific tests included determinations of extent to which 22 industries are increasing production, employment and payrolls, and whether money collected is being returned to the public in the form of wages or to a few individuals as interest and dividends.

Production Ranks 16th

Oil and gas production was rated in sixteenth place by Kreps. He stated this industry "has done an excellent job of production, but it has not helped to solve the problem of unemployment." Payrolls in refining have kept pace with the increased amount of money collected from the public, he said.

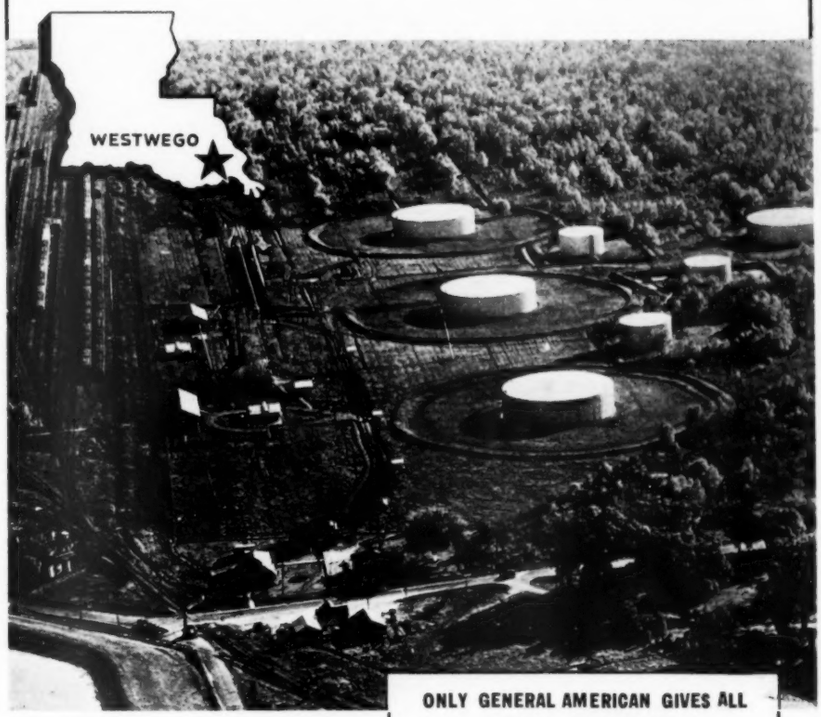
Industries covered by Kreps, in the order in which he ranked them on the basis of contributions to the free enterprise system, follow:

Baking and confectionery, knit goods, canning and preserving, agricultural implements, petroleum refining, automobiles, boots and shoes, slaughtering and meat packing, cotton goods, woolen and worsted goods, chemicals, electric light and power, iron and steel, paper and pulp, flour and other grain mill products, oil and gas producing, furniture, metal mining, tobacco, coal mining, lumber and timber products, and steam railroads.

Rises 3.2% in Canada

OTTAWA, March 31.—Official figures just published show total number of motor vehicles registered in Canada in 1939 was 1,439,245, an increase of 3.2% over the year previous. Of these, 1,190,021 were passenger cars, 231,474 trucks, 2644 buses, 12,322 motorcycles, 1148 tractors and 3005 ambulances and hearses and 752 cranes and service cars.

Go Westwego---- and miss the Mississippi



Producers of bulk liquids west of the Mississippi can ship via New Orleans with no river-crossing charge, thanks to General American's Westwego Terminal. This modern plant brings you seven *exclusive* advantages—gives you complete facilities without investment on your part. Tailored to suit your needs, great or small, General American Service will save you money every day—every way!

ONLY GENERAL AMERICAN GIVES ALL THESE ADVANTAGES:

1. NO CONTAMINATION. Separate pumps, lines, storage zones for dissimilar commodities.
2. MODERN PROTECTION. Latest safety appliances; lowest insurance rates, minimum evaporation losses.
3. RELIABLE CUSTODIANSHIP. Our warehouse receipts are highest type of collateral everywhere.
4. INDEPENDENT OWNERSHIP. Strictest privacy; we do not buy, sell or refine any commodities.
5. NO WHARFAGE. There is no wharfage charge at our own private docks.
6. SPEED WITH SAFETY. Day and night crews, complete facilities, eliminate all shipping delays.
7. WORLD'S LARGEST TANK CAR FLEET. One car or hundreds, wherever and whenever needed.

GATX GENERAL AMERICAN

Strategically located to serve you!

GENERAL AMERICAN TANK STORAGE TERMINALS

Goodhope, La. and Westwego, La., (Port of New Orleans)
Corpus Christi, Texas
Carteret, N. J. (Port of New York) Galena Park, Texas (Port of Houston)

A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

MERCHANDISING

Is This Marketer Right or Wrong?

One of our good independent marketing friends out West wrote us recently for our opinion on the following practice. It is one on which some of our readers may have an opinion.

This marketer invited rural customers to bring their containers into the bulk plant and get them filled. He figured out what he thinks is a fair price to pay these customers for hauling their own gasoline—around 1.5c per gal. This figure is based on what the marketer believes would be his cost in making the delivery himself. The gasoline is sold at the regular market price to these customers, but at the time of delivery the customer is given a check for "cartage" based on the customer's dump and hauls.

According to this marketer, 2 major companies have construed this as a price cut, and accordingly reduced their tank wagon price 1.5c per gal. in the county where he operates. This marketer, however, is maintaining the tank wagon price in effect in adjoining counties.

The "argument", from this marketer's viewpoint, to quote from his letter, is:

"Why should there not be a difference in price to the farmer-customer who hauls his own gasoline in view of the fact that the majors pay their truck driver salesmen different compensation for country and city deliveries. On the country deliveries the driver receives around 1.5c commission per gal., while on city deliveries his commission is only 0.5c per gal.

"Another question: why should a driver receive the same amount of commission for delivering gasoline one mile out in the country or 12 miles? The railroads and transports rates are based on mileage as we all know.

"I am not trying to change or reform the world, but a lot of things in the oil industry have always seemed screwey to me and they usually work against the small independent."

This marketer feels that he is not getting a square deal; that he is simply paying his customers what he would otherwise spend in delivery costs, and that he is not cutting prices or upsetting markets.

Conversely, the major companies, and perhaps other independents, feel that this is a price cut and are meeting it.

The question here turns chiefly on whether the cost of the oil marketer making the delivery is the same as the cost to the customers in picking up the oil and gasoline. It would seem that the customers are coming to town with their trucks anyway, and it doesn't cost them any more to pick up the oil and gasoline. On a properly organized truck route, does it, or should it, cost 1.5c a gal. to make deliveries in any reasonable distance that a truck should try to cover in a day?

Another point: Is it possible that since this marketer has his truck out anyway, is he making deliveries to out-of-the-way farms in small quantities where the owners do not consider even a cartage allowance worth the trouble?

NPN would be glad to have its readers' opinion on this controversy.

New accounts knocked off with "tire wedge"

Seven oil marketers out of ten who are now in the tire business, act as tire distributors. In analyzing the tire and battery survey recently published in NPN (March 19, 1941, p. 30), a study was made of oil marketer lists in the entire country. It indicated that there are at least 10,000 independent oil marketers in the United States, and that 62% of them sell tires. It was further found that oil marketer tire distributors sell on an average of 5 outlets which do not sell the distributors brand of gasoline.

Letters from marketers would indicate that these 5 tire outlets are just that many additional wedges being used to knock off pieces of new gasoline business.

For instance, H. S. Estes of the Simpson Oil Co., Charleston, Mo., says:

"We consider the tires, tubes, batteries and other accessories as very essential to our gasoline distribution. In fact, we find when making deals on our gasoline with our various dealers that it is much easier for us to make a deal with them since we have these other items to offer them, which is a profitable side line.

"We believe that the future will see an increase in the marketing of these items through the better service stations, and it is our intention to push this end of our business in such a way that we will realize even a better business in the future than we have had in the past."

Future bright for Iowa marketer

HONING & BENNETT of Richland, Iowa, come forward with a new slant on marketing accessories in smaller towns. They say:

"We think the future of the oil marketer looks good for the sale of tires, batteries and other auto accessories. They have a chance to contact more people, and another advantage is that the stations are open evenings and Sundays in the smaller towns, when about all the garages are closed."

Lubrication versus "grease jobs"

L. R. Christie, Secretary-Treasurer of the United Oil Corp., Columbus, Ga., believes that the public generally will pay a fair profit where they know they will get value received. As an example of that, he tells us his company's experience in lubrication jobs. He writes:

"We believe that the public is becoming more and more educated to the fact that they all more or less get exactly what they pay for and that they are willing to pay anyone a fair profit where they know they will get value received. We believe anyone sticking steadfastly to this program will eventually come out ahead. As an example of this, about a year or two ago at one of our company meetings the fact was brought out that we charged $1 for a lubrication job, whereas nearly all the major companies in the city, and most all of the "gip stations" charged anywhere from 50c to

WEBB OIL CO.
Saved $149.25 a month with WITTE DIESELECTRIC PLANTS

● "Our light and power bills were costing us $176.00 to $190.00 per month before we installed Dieselectrics. We have kept an accurate check on operating costs of these WITTE Dieselectric Plants and at no time has our cost exceeded $28.75 per month". — Webb Oil Co.

Thus this Texas service station saves a minimum of $149.25 each month. Get a WITTE Dieselectric—3 to 30 K.V.A.; 1, 2 and 4 cylinder. *Write* now for complete information.

3704 Oakland Ave. Kansas City, Mo.

WITTE ENGINE WORKS
• LARGEST BUILDER OF SMALL DIESELS •

52
ISSUES
$3

News . . . Markets . . . Technical Developments . . . Merchandising Ideas . . . Operating Helps . . . Tax and Transportation News . . . Statistics, etc.

in

NATIONAL PETROLEUM NEWS

Every Week

National Petroleum News
Cleveland, Ohio

Send NPN to me for the next 52 weeks. Enclosed is $3 for one year. (Canada and Foreign $4.50.)

NAME .....

St.-Box .....

City-State .....

75c. While some of them in our organization thought that we should cut down to the competitive price, yet the majority stuck to the fact that we gave the customer a guaranteed lubrication job, and we taught this to the trade and we showed them, and invited their inspection and comparison with every dealer. The consequence is that we are getting, and have been getting, increased lubrication business from then until now".

How much is a "grease job"?

Some marketers may not agree with Mr. Christie that $1 can be had for a lube job. On the other hand some garages do a big business at even higher prices than that. We thought that 75c was more or less standard price. Perhaps there are many marketers getting more, and have some ideas that would be of interest to NPN readers.

What becomes of old tires?

Marketers are frequently asked this question. Perhaps the war will change the story, but at present several hundred thousand of them are retreaded, and sold over the world. One Cleveland used tire dealer sent 100,000 to Russia once on a single order. Used tires are also made into shoes, floor mats, rubber bands, buffers, shock absorber material, and many other uses. In Mexico and Spain, rubber shoes made from old tires are popular.

Used tires and rheumatism

Some marketers get headaches from the tire business. Mr. Christie's letter from Georgia reminds us that we have heard that superstitious Negroes in that state sleep with an old auto tire around their waist in the belief that it is the best cure for rheumatism.

There is always something new under the sun.

Marketers advertise their metered trucks

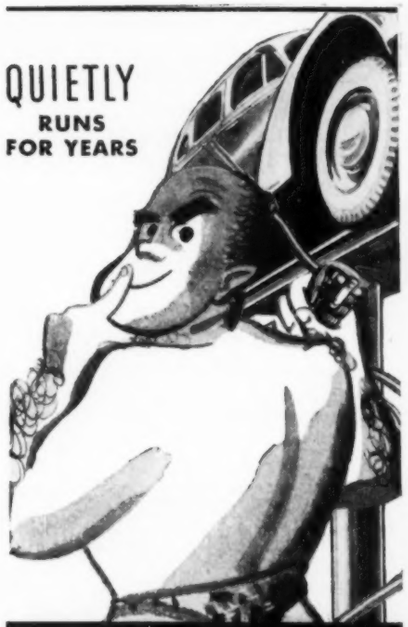
In the classified section of the latest edition of a metropolitan phone book, fuel oil display ads are carried by 6 fuel oil distributors. Five of these advertisers stress their delivery service in metered trucks.

"Modern metered trucks", "accurate metered delivery", "meter delivery" and so on, is a feature of each of these ads.

Evidently these distributors have found that the fuel oil consumer considers meter delivery one of the desirable features of oil heat.

Tube promotion

According to one of the large tire companies, only 86 tubes were sold per 100 tires in 1940. Here is another potential profit maker for marketers that could be "cracked" with very little promotion.

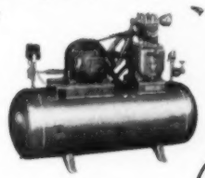


HE'S GOT
MacTAVISH
BLUSHING

Buy Brunner for Thrift

"We're replacing our Brunner after 20 years of economical service but only for a larger Brunner." Twin Bridges Garage, Twin Bridges, Mont.

● Dependable and economical operation of air compressors is important for profitable management in automotive service. That's why many major oil companies specify Brunner. They know that station managers are pleased with the quiet operation... efficiency... and long life of Brunner compressors. Besides, the low operating and maintenance cost makes Brunner compressors "tighter" than the proverbial Scotchman. Available from ¼ to 10 h. p. Write Brunner Manufacturing Co., Utica, N.Y., U.S.A.

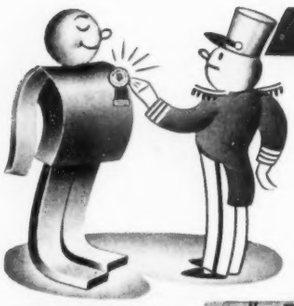


GET THESE MONEY SAVING FACTS

Send for this "inside story" Brunner superiority illustrated point by point.

BRUNNER

FOR OVER 30 YEARS
THE SYMBOL OF QUALITY



DAN, THE RUBBER MAN

THE MAJOR'S CHOICE!

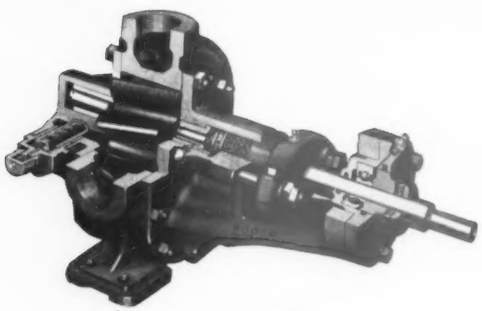
★ Over 40 Major Oil Companies feature **RUGLYDE** in their 1941 lubrication programs! 100% *Safe* for rubber parts requiring a penetrating lubricant. *Safe on Rubber* — Lubricates and preserves. *Safe on Car Finish* — Won't harm the finest lacquers. *Safe on Service Man* — Non-flammable, non-poisonous. Learn how we can serve *your* requirements in regular or special brand packages.

DOOR-EASE STAINLESS STICK LUBRICANT for door dovetails, striker plates, rubber bumpers and seals, hood lacings, and other exposed friction surfaces.

Available in 8-oz. refillable applicator cans and 1-gallon refills.

AMERICAN GREASE STICK CO.
MUSKEGON, MICH.

KETCHUM FINDS ROPER PUMPS *Save Unloading Time!*



"I own and operate a fleet of fourteen transport trucks. Most of these transports are equipped with Roper Truck Pumps . . . These Roper Pumps are simple in design and require practically no upkeep expense; are quiet in operation; and speedy, so my transports use less unloading time. This saving in unloading time means profits to me, because transports have to be kept moving to be profitable."

J. E. KETCHUM
J. E. Ketchum Oil Co.
Chanute, Kansas

■ Quick to start . . . quick to dispense gallonage . . . Roper Truck Pumps are both time savers and money savers. They will definitely increase the efficiency of your delivery fleet by enabling you to dispense more gallons per hour and to make more deliveries per day . . . furthermore, you'll find Ropers extremely quiet despite their greater speed. Roper simplicity of design . . . only two moving parts . . . assures smooth performance and longer life. Easy to install . . . easy to service.

Write for **BULLETIN N278**

GEO. D. ROPER CORP., ROCKFORD, ILLINOIS

ROPER TRUCK PUMPS

Refinery Fire Per Plant Is 1 in 150 Years

The fire hazard in the average refinery, tank farm, or service station is only one-third as great as in the average residence, according to J. Howard Myers, director of the Safety and Fire Prevention Division, Atlantic Refining Co.

This fact is the high light in a new sound moving picture now being shown by representatives of Atlantic. The film reports that the probability of a tank fire in the average petroleum plant is one fire per plant every 150 years.

Safety film covers the causes of fires and demonstrates various means of preventing fires and extinguishing them once they start. The oil industry's record is a tribute to employes in all branches of the industry, Mr. Myers declared.

Industry in America To Shun Profiteering

"Industry in the United States does not wish to profit on defense work," asserted Verl L. Elliott, comptroller of the Atlantic Refining Co., "and it is in much better condition to fulfill the present defense program than it was in 1917 or 1918."

Speaking in Philadelphia before the Philadelphia Control of the Controllers' Institute of America of which he is national president, Mr. Elliott pointed out that proper business accounting could do a great deal to avoid inflationary tendencies at the end of the present business cycle and its aftermath if all accounting in the "defense program era" were done on "a conservative basis."

"Let's reflect our profits in cash, and not keep records on a basis that shows inflated profits and asset valuations as was done in the 20's," Mr. Elliott suggested.

TRADEMARKS

The following are trademark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Munsey Building, Washington, D. C., trademark specialists.

GRECOR, Ser. No. 438,510, Gredag Corp., Niagara Falls, N. Y. Filed: Dec. 4, 1940. For motor oils and graphited oils both colloidal and powdered intended for lubricating purposes. Published: March 25, 1941.

SOLUTIZED SHELL, Ser. No. 439,128, Shell Oil Co., Inc., San Francisco. Filed: Dec. 23, 1940. For gasoline. Published: March 25, 1941.

SPITFIRE GASOLINE on fanciful background lined for red and blue. GASOLINE disclaimed apart from mark. Ser. No. 440,193, Douglas Oil & Refining Co., Los Angeles. Filed Feb. 1, 1941. For gasoline and motor oils and greases. Published: March 25, 1941.

COL-ITE, Ser. No. 438,007, Richard E. Houser, Houston, Texas. Filed: Nov. 18, 1940. For lubricating oil which has cleaning, penetrating, and rust preventing properties. Published: March 18, 1941.

MARKETS

Atlantic Coast

NEW YORK, March 29. — Higher prices for gasoline and light fuel oils at many seaboard points were reported by Atlantic Coast suppliers the week ended March 29.

Low quotations for min. 80 oct. ('39 research) gasoline were reported up 0.25c to 6c at New York and central seaboard points, while advances at other points ranged from 0.125 to 0.40c, according to reports. Advances of 0.125 to 0.25c were reported at some points for 68-70 and 72-74 oct. gasolines also.

Interest was shown in barge lots of 72-74 oct. gasoline at New York harbor, with several inquiries from supplier-buyers at 6.25c reported. Quotations reported by suppliers for barge lots of this grade ranged from 5.50 to 6.25c. Some suppliers quoting 5.50c said they were not interested in selling to their competitors at this price.

Suppliers' prices for Nos. 2 and 3 fuel oils were reported up 0.2c at New York and other northern points, with New York harbor prices at 4.20c tank cars and 4.10c barges. Low quotations for diesel oil, ships' bunkers, were reported up 10c at the same points, and many suppliers also reported a rise of 0.2c in their prices for kerosine at New York harbor, reflecting, they said, increased tanker rates from the Gulf and reduction in seaboard stocks due to prolonged cold weather.

Mid-Continent

TULSA, March 29.—All grades of gasoline were up 0.125 to 0.375c on lows of price ranges in Oklahoma the past week with advances in their quotations reported by 5 refiners.

Quotations reported ranged from 5 to 6c for 80-82 oct. Ethyl, 4.50 to 5c for 72-74 oct., 4.125 to 4.50c for 63-66 oct., 3.75 to 4.125c for 60 oct. and below, and 3.875 to 4c for 60-62 gravity, 400 e.p.

Oklahoma refiner who had been quoting "4.125 to 4.50c" for 72-74 oct. reported asking "4.25 to 4.625c." The lower price was for shipment into restricted competitive areas, he said. One Oklahoma refiner reported sales of 3 cars of 72-74 oct. at 4.625c and 1 car of 60 oct. and below at 3.875c.

Shipments of gasoline were heavy and stocks were low, according to most refiners. Purchases of 10 cars of 72-74 oct. and 15 cars of 80-82 oct. Ethyl were reported by an Oklahoma refiner. "We are about 7 days behind on shipments, and buying almost daily to keep up on commitments," he said. Prices he paid were not disclosed. Several others said they were "having trouble" finding refiners who were willing to sell for resale.

Grade 26-70 natural gasoline was quoted 0.125c higher at 2.875c by one seller for shipment FOB Group 3 late in the week; two other sellers reported quoting 2.75c. Quotations for shipment FOB Breckenridge were up 0.25c to 2.50c flat when three sellers reported quoting this price. Last reported sales prices were at 2.75c, FOB Group 3, and 2.375c, FOB Breckenridge.

Gulf

NEW YORK, March 29.—Gasoline inquiries comprised the major activity at the Gulf the past week, according to reports here and from the southwest, with inquiries for cargoes of min. 80 oct. ('39 research) reported daily by Gulf refiners. One, described as a "combination inquiry", called for a cargo each of gasoline, No. 2 fuel, and 41-43 kerosine for coastwise lifting.

Late in the week one refiner reported 80,000 bbls. of min. 80 oct. sold at 5.25c for last-half-of-April coastwise lifting and said that he was now offering at the same price for first-half-of-May lifting. Other quotations reported for this grade ranged to 5.75c.

Higher prices for other gasolines were reported at the end of the week with low quotations for 72-74 oct. leaded up 0.375c to 5c and for both 65 and 60 oct. unleaded up 0.125c above previous low levels, according to reports.

A barge-lot sale of 8000 bbls. of 41-43 kerosine at 3.50c was reported late in the week. Kerosine was said to be still available at 3.25c in cargo lots.

Mid-Western

CHICAGO, March 29.—Some grades of gasoline were priced higher in Chicago the last week of March. Shipments against contracts continued heavy, according to reports, and open spot gasoline sales reported by tank car marketers during the week totaled 12 cars.

High octane gasoline prices reported by refiners ranged from 5.625 to 6c for 80-82 oct. Ethyl, and 4.50 to 5c for 72-74 oct., up 0.125 to 0.25c on the lows. Quotations reported by tank car marketers for these two grades ranged from 4.375 to 4.625c, and 3.75 to 4.125c, respectively.

Open spot sales reported by three tank car marketers were: 9 cars of 72-74 oct., 7 cars at 3.875c, 1 car at 4c, and 1 car at 4.125c; 3 cars of 63-66 oct. at 3.625c; and 2 cars of No. 2 straw fuel at 3c, all FOB Group 3.

Quotations reported by refiners ranged from 4.125 to 4.50c for 63-66 oct., and 3.25 to 3.50c for No. 2 straw fuel, while tank car marketers reported quotations ranging from 3.625 to 3.75c, and 3 to 3.375c, for the same two products, respectively.

California

LOS ANGELES, Mar. 29.—Apparently influenced to some extent by the upward trend at the Gulf, prices 0.125 to 0.25c per gal. higher for gasoline were asked by Pacific Coast export suppliers the past week, according to reports here. Cargo quotations reported by exporters ranged from 4.625 to 5c for 60 oct. minimum; 4.75 to 5.125c for 400 e.p., 65 oct. minimum; 5.125 to 5.375c for 390 e.p., 68 oct. minimum; and 5.375 to 5.625c for 375 e.p., 70 oct. minimum.

Kerosine-distillate was reported offered at $1.10 per bbl. at independent plants in the Los Angeles Basin, with no sales reported. However, owing to the increasing calls from the defense industries, the demand for gas and diesel oils was said to be good at prices ranging from $1.20 to $1.26 per bbl.

With the exception of a small quantity of off-color motor fuel said to be offered at 4.375c per gal., third grade gasoline at independent refineries in the Basin area were reported to range from 4.5 to 5c at the rack.

Pennsylvania

CLEVELAND, March 29. — Higher prices for bright stock, neutral oils, and wax featured the western Penna. market the past week. Demand against contracts, particularly for lubes, continued heavy, refiners said. Buyers in some instances said they were finding it hard to obtain neutral oils at prices which refiners said they were quoting to jobbers and compounders.

Quotations reported by refiners for neutral oils were up 1c at 23 to 24c for 25 pour test 200 vis. oil, and 21 to 22c for 25 pour 150 vis. Late in the week, a resale agent said he had had to pay 23c for 3 cars of 200.

Refiners reported quotations ranging from 15 to 15.50c for 25 pour test bright stock, up 0.5c on the low, 1c on the high. Quotations reported for white crude scale wax were up 0.05c to 0.4c, ranging from 2.90 to 3.25c, New York. Buyers said supplies were closely held by refiners.

Light products quotations for the most part were reported unchanged.

REFINERY and SEABOARD PRICES

In bulk lots by Motor Transport, Tank Car, Barge or Tanker as shown

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

HOW PRICES ARE REPORTED—

Refinery and Seaboard prices in National Petroleum News are gathered by PLATT'S OILGRAM and are as published in the Monday issue of the OILGRAM.

PLATT'S OILGRAM is a reporting service issued in three identical editions daily from News Bureaus at New York, Cleveland, and Tulsa, Okla. PLATT'S OILGRAM gathers and publishes what its publisher and representatives believe to be accurate news of sales, prices and current happenings affecting the oil industry and that will be of interest to its subscribers. As this information is usually private, OILGRAM reports it according to what it is able to obtain from sources deemed reliable.

All information is supplied without guarantee as to its completeness, accuracy time of transmission or promptness of delivery.

The subscriber receives this information for his private use and not for resale or further distribution.

Publisher reserves the right to change the extent, nature and form of showing this information at any time.

Prices shown in the tables are quotations (meaning sellers' general offers or posted prices), or actual sales prices, reported to OILGRAM by refiners for "open spot" transactions, except as otherwise specified.

Prices arrived at by discounts off a specified price or "market date of shipment," prices named in contracts or prices arrived at in accordance with any arrangement made prior to date of sale, are not for "open spot" transactions and therefore are not considered in making the price tables. Prices made to brokers and prices in "Inter-refinery" transactions are also not considered except as may be noted.

All prices are for "immediate" shipment except in Gulf Coast bulk transactions where shipment is generally to be made in ninety days. Prices are FOB refineries, pipelines, or tanker terminals in districts designated.

Prices shown are for quantities in bulk such as tank car lots, motor transport lots or barge lots; and in cents per gallon; heavy fuel oils are in dollars per barrel of 42 U.S. gallons; wax and petrolatums are in cents per pound. Prices applying to barges or cargoes only are so designated.

Prices do not include taxes or inspection fees. Prices are published at the close of the business day.

Mid-Western prices in the tables were gathered from refiners with offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Other refinery prices are given by and for the particular refining district where the material is made and from which it is shipped.

When prices obtained by OILGRAM do not conform to these conditions the exception and the new conditions are noted in the news lead or in conjunction with the price table by footnote or otherwise, for the particular refinery or sales district involved.

Crude oil and products covered by OILGRAM'S news and price service, except where noted, have been represented to the publisher as fully up to the customary trade specifications indicated and according to the generally accepted methods of test; and all crude oil and all products thereof as having been lawfully produced and transported.

Any apparent error should be reported to the nearest OILGRAM or National Petroleum News office at once as no correction will be made after the second issue of the OILGRAM or National Petroleum News following its publication.

Summary of Daily Gasoline Prices (Mar. 25 to Mar. 31)

	Latest Prices Monday, Mar. 31	Friday, Mar. 28	Thursday, Mar. 27	Wednesday, Mar. 26	Tuesday, Mar. 25
U. S. Motor, (ASTM octane)					
80-82 octane Ethyl:					
Oklahoma	5.125– 6.00	5.00 – 6.00	5.00 – 6.00	5.00 – 6.00	5.00 – 6.00
Mid-Western (Group 3 basis)	5.625–6.00 (2)	5.625–6.00 (2)	5.625–6.00 (2)	5.50–6.00 (2)	5.50–6.00 (2)
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	5.50 – 5.75	5.25 – 5.75	5.25 – 5.75	5.25–5.75 (2)	5.25–5.75 (2)
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	5.75 (1)	5.75 (1)	5.75 (1)	5.75 (1)	5.75 (1)
72-74 octane:					
Oklahoma	(a) 4.625–5.00	(b) 4.50–5.00	(b) 4.50–5.00	(b) 4.50–5.00	(b) 4.50–5.00
Mid-Western (Group 3 basis)	4.625– 5.00	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.50 – 5.25	4.50 –5.125	4.375– 5.125	4.375– 5.125	4.375– 5.125
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.625–4.75 (2)	4.625–4.75 (2)	4.625–4.75 (2)	4.625–4.75 (2)	4.625–4.75 (2)
63-66 octane:					
Oklahoma	4.25 – 4.50	4.125– 4.50	4.125– 4.50	4.125– 4.50	4.125– 4.50
Mid-Western (Group 3 basis)	4.125– 4.50	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50	4.00 – 4.50
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.125– 5.00	4.125– 5.00	4.125– 5.00	4.125– 5.00	4.125– 5.00
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	4.125–4.25 (2)	4.125–4.25 (2)	4.125–4.25 (2)	4.125–4.25 (2)	4.125–4.25 (2)
60 octane & below:					
Oklahoma	3.875–4.125	3.75 –4.125	3.75 – 4.125	3.75 –4.125	3.75– 4.125
Mid-Western (Group 3 basis)	3.75 –4.125	3.625–4.125	3.625–4.125	3.625– 4.125	3.625– 4.125
N. Tex. (For shpt. to Tex. & N. M. dest'ns.)	3.75 – 4.50	3.625– 4.50	3.50 – 4.50	3.50 – 4.50	3.50 – 4.50
W. Tex. (For shpt. to Tex. & N. M. dest'ns.)	3.75–4.00 (2)	3.75–4.00 (2)	3.75–4.00 (2)	3.75–4.00 (2)	3.75–4.00 (2)
Motor Gasoline, 72-74 octane (ASTM)					
New York harbor	5.75 – 6.50	5.75 – 6.50	5.75 – 6.50	5.75 – 6.50	5.75 – 6.00
New York harbor, barges	5.50 – 6.25	5.50 – 6.25	5.50 – 6.25	5.50 – 6.00	5.50 – 6.00
Philadelphia district	5.75 – 6.25	5.75 – 6.25	5.75 – 6.25	5.75 – 6.25	5.75 – 6.25
Baltimore district	6.00 (2)	6.00 (2)	5.75–6.00 (2)	5.75–6.00 (2)	5.75–5.875 (2)
Motor Gasoline:					
74-76 Octane: (L-3)					
Bradford-Warren (Western Penna.)	6.00–6.25 (2)	6.00–6.25 (2)	5.75 – 6.25	5.75 – 6.25	6.00 – 6.25
Other Districts (Western Penna.)	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00	5.75 – 6.00

REFINERY PRICES

Gasoline—U. S. Motor (ASTM Octane) except where otherwise specified

Prices Effective	Mar. 31	Mar. 24
OKLAHOMA		
80-82 oct. Ethyl	5.125– 6.00	5.00 – 6.00
72-74 oct.	(a) 4.625– 5.00	(a) 4.50–5.00
63-66 oct.	4.25 – 4.50	4.125– 4.50
60 oct. & below	3.875–4.125	3.75 – 4.125
60-62 400 e.p.	3.875–4.00 (2)	3.75–4.00 (2)
MID-WESTERN (Group 3 basis)		
80-82 oct. Ethyl	5.625–6.00 (2)	5.375–6.00 (2)
72-74 oct.	4.625– 5.00	4.375– 5.00
63-66 oct.	4.125– 4.50	4.00 – 4.50
60 oct. & below	3.75 –4.125	3.625– 4.125
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
80-82 oct. Ethyl	5.50 – 5.75	5.25–5.75 (2)
72-74 oct.	4.50 – 5.25	4.375– 5.125
63-66 oct.	4.125– 5.00	4.125– 5.00
60 oct. & below	3.75 – 4.50	3.50 – 4.50
60-62, 400 e.p.	4.125–4.75 (2)	4.125–4.75 (2)
W. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
80-82 oct. Ethyl	5.75 (1)	5.875 (1)
72-74 oct.	4.625–4.75 (2)	4.625–4.875 (2)
63-66 oct.	4.125–4.25 (2)	4.125–4.375 (2)
60 oct. & below	3.75–4.00 (2)	3.875–4.125 (2)
CENT. W. TEX. (Prices to truck transports)		
80 oct. & above	5.75 (1)	5.75 (1)
72-74 oct.	4.625 (1)	4.625 (1)
67-69 oct.	4.125 (1)	4.125 (1)
62 oct. & below	3.75 (1)	3.75 (1)
AMARILLO, TEX. (For shpt. to W. Okla. & Tex. differential territory.)		
60 oct. & below	4.50 (1)	4.375 (1)
60-62, 400 e.p.	4.75 (1)	4.75 (1)

Prices Effective	Mar. 31	Mar. 24
KANSAS (For Kansas destinations only)		
80-82 oct. Ethyl	5.75 (1)	5.50 (1)
72-74 oct.	4.75 –4.938	4.50 – 4.875
63-66 oct.	4.25 – 4.75	4.25 – 4.75
60 oct. & below	3.875–4.188	3.875– 4.125
ARK. (For shipment to Ark. & La.)		
72-74 oct.	4.625 (1)	4.50 (1)
70-72 oct.	4.50 (1)	4.375 (1)
60 oct. & below	4.125 (1)	4.00 (1)
WESTERN PENNA. (Motor gasoline.)		
Bradford-Warren:		
74-76 oct. (L-3)	6.00–6.25 (2)	6.00 – 6.25
Other districts:		
74-76 oct. (L-3)	5.75 – 6.00	5.75 – 6.00
CENTRAL MICHIGAN (FOB Central Mich. refinery group basis for shpt. within Mich.; shpts. may originate at plants outside Central group)		
U.S. Motor: (Oct. L-3):		
72-74 oct.	6.50 – 7.00	6.50 – 7.00
67-69 oct.	5.75 – 6.50	5.75 – 6.50
Str. run gasoline, excluding Detroit shpt.	4.75 – 5.25	4.50 – 5.25
OHIO (S. O. Ohio quotations for statewide delivery and subject to exceptions for local price disturbances)		
72-74 oct.	7.125	7.125
CALIFORNIA U.S. Motor:		
58-61 grav., 375-400 e.p., 65 oct. & above	5.50 – 6.50	5.50 – 6.50
54-58 grav., for outside state shipment	5.00 – 6.00	5.00 – 6.00
54-58 grav., for instate shipment	4.75 – 5.50	4.75 – 5.50

Kerosine, Gas & Fuel Oils

Prices Effective	Mar. 31	Mar. 24
OKLAHOMA		
41-43 grav. w.w.	4.00 – 4.25	4.00 – 4.25
42-44 grav., w.w.	4.25 – 4.375	4.25 – 4.375
Range Oil	3.875– 4.125	3.875– 4.125
No. 1 P.W.	3.75 – 4.125	3.75 – 4.125
No. 1 straw	3.375–3.75 (2)	3.375–3.75 (2)
No. 2 straw	3.375– 3.625	3.375– 3.625
No. 2 dark	3.25 (1)	3.25 (1)
U.G.I. gas oil	3.25 (2)	3.25 (2)
No. 3 fuel	3.25 – 3.375	3.25 – 3.375
No. 6 fuel	$0.70 (1)	$0.65 (1)
14-16 fuel	$0.85 (1)	$0.85 (1)
MID-WESTERN (Group 3 basis)		
41-43 grav. w.w.	4.125– 4.25	4.125– 4.25
42-44 grav. w.w.	4.25 – 4.375	4.25 – 4.375
Range Oil	3.875 (2)	3.875 (2)
No. 1 p.w.	3.75 – 3.875	3.75 – 4.00
No. 2 straw	3.25 – 3.50	3.25 – 3.50
No. 3	3.125– 3.375	3.125– 3.375
No. 5	$0.75–$0.85 (2)	$0.75–$0.85 (2)
No. 6	$0.60–$0.65 (2)	$0.575–$0.60 (2)
N. TEX. (For shpt. to Tex. & N. M. dest'ns.)		
41-43 grav. w.w.	3.75 – 4.75	3.75 – 4.75
No. 1 P.W.	3.875 (1)	3.875 (1)
AMARILLO, TEX. (For shpt. to W. Okla. & Tex. differential territory.)		
41-43 grav. w.w.	4.50–4.75 (2)	4.50–4.75 (2)
No. 1 straw	4.00 (2)	4.00 (2)
KANSAS (For Kansas destinations only)		
41-43 grav. w.w.	4.25 (1)	4.25 (1)
42-44 gravity w.w.	4.375– 4.50	4.375– 4.50
No. 1 p.w.	4.00 – 4.25	4.00 – 4.25
No. 6 fuel	$0.65–$0.70 (2)	$0.65 (2)

(a) One refiner reported quoting "4.375-4.75c" for 72-74 oct., the lower price applying only to shipments into restricted competitive areas. (b) One refiner reported quoting "4.25-4.625c" for 72-74 oct., the lower price applying only to shipments into restricted competitive areas.

REFINERY PRICES (Continued)

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

Kerosine, Gas & Fuel Oil

(Continued)

Prices Effective	Mar. 31	Mar. 24
ARK. (For shipment to Ark. and La.)		
41-43 grav. w.w.	4.375 (1)	4.375 (1)
No. 1	3.875 (1)	3.875 (1)
No. 2	3.375 (1)	3.375 (1)
No. 3 fuel	3.25 (1)	3.25 (1)
Tractor fuel, for shpt to Ark. points only	4.25 (1)	4.25 (1)
WESTERN PENNA.		
Bradford-Warren:		
45 grav. w.w.	5.25 – 5.50	5.375– 5.50
46 grav. w.w.	5.625 (1)	5.625 (1)
No. 1 fuel	5.125– 5.50	5.25 – 5.50
No. 2 "	5.125–5.50 (2)	5.125– 5.50
No. 3 "	5.50 (1)	5.50 (1)
36-40 gravity	5.25 (1)	5.25 (2)
Other districts:		
45 grav. w.w.	5.125– 5.25	5.125– 5.25
46 grav. w.w.	5.25 – 5.375	5.25 – 5.375
47 grav. w.w.	5.375– 5.50	5.375– 5.50
No. 1 fuel	4.875– 5.00	4.875– 5.00
No. 2 "	4.875– 5.00	4.875– 5.00
No. 3 "	4.75–4.875 (2)	4.625–4.875 (2)
36-40 grav., Pittsburgh dist. prices excluded	4.50 –4.625	4.375– 4.625

CENTRAL MICHIGAN (FOB Central Mich. refinery group basis for shpt. within Mich.; shpts. may originate at plants outside Central group.)

47-49 gravity w.w.	5.50 – 5.75	5.50 – 5.75
P.W. Distillate	5.50 – 5.65	5.50 – 5.65
No. 3 gas oil, Straw	5.00 – 5.25	5.00 – 5.25
U.G.I. gas oil	4.25 – 4.50	4.25 – 4.50
Fuel Oils (Vis. at 100)		
300-500 Vis.	3.75–4.00 (2)	3.75–4.00(2)
100-300 Vis.	4.125 (1)	4.125 (1)

OHIO (S. O. Ohio quotations for statewide delivery)

Kerosine	5.75	5.75

CALIFORNIA

40-43 grav. w.w.	4.50 – 6.00	4.50 – 6.00
San Joaquin Valley:		
Heavy fuel	$0.575 –$0.65	$0.575 –$0.65
Light fuel	$0.65 –$0.75	$0.65 –$0.75
Diesel fuel	3.00 – 4.00	3.00 – 4.00
Stove dist.	3.00 – 5.00	3.00 – 5.00
Los Angeles:		
Heavy fuel	$0.575 –$0.65	$0.575–$0.65
Light fuel	$0.65 –$0.75	$0.65 –$0.75
Diesel fuel	3.00 – 4.00	3.00 – 4.00
Stove dist.	2.75 – 4.00	3.00 – 4.00
San Francisco:		
Heavy fuel	$0.80	$0.80
Light fuel	$0.90	$0.90
Diesel fuel	4.50	4.50
Stove dist.	5.50	5.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Lubricating Oils

WESTERN PENNA.

Prices are given by Penna. refiners as their quotations to jobbing and compounding trade only. Prices to other refiners generally are lower.

Viscous Neutrals—No. 3 col. Vis. at 70° F.

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	27.50 (1)	26.50 (1)
10 p.t.	26.50 (1)	25.50 (1)
15 p.t.	25.50 (1)	24.50 (1)
25 p.t.	23.00–24.00	22.00 – 23.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	25.50 (1)	24.50 (1)
10 p.t.	24.50 (1)	23.50 (1)
15 p.t.	23.50 (1)	22.50 (1)
25 p.t.	21.00–22.00	20.00 – 21.00
Cylinder Stocks		
Brt. stk., 145-155 vis. at 210°, 540-550 fl., No. 8 col.		
10 p.t.	17.50 (1)	17.50 (1)
15 p.t.	16.50 (1)	16.50 (1)
25 p.t.	15.00–15.50	15.00
600 S.R. filterable	9.00–10.00	9.00 –10.00
650 S.R.	9.00–12.00	9.00 –11.50
600fl	10.00	10.00 –12.00
630fl	11.00–12.00	11.00 –12.00

MID-CONTINENT (F.o.b. Tulsa)

Neutral Oils (Vis. at 100° F. 0 to 10 P.P.)

Pale Oils: Vis.	Color		
60-85	No. 2	5.50 – 5.75	5.25 – 5.75
86-110	No. 2	5.50 – 6.25	5.25 – 6.25
150	No. 3	8.00 –10.25	8.00 –10.25
180	No. 3	8.50 –10.50	8.50 –10.50
200	No. 3	8.50 –11.00	8.50 –11.00
250	No. 3	10.00 –12.00	10.00 –12.00
280	No. 3	10.50 –13.75	10.50 –13.75
300	No. 3	11.50 –14.25	11.50 –14.25

Lubricating Oils (Cont'd)

Prices Effective	Mar. 31	Mar. 24
Red Oils:		
180	No. 5	8.50–9.50 (2)	8.50–9.50 (2)
200	No. 5	8.50–10.50 (2)	8.50–10.50 (2)
280	No. 5	12.50 (1)	12.50 (1)
300	No. 5	11.00 –12.50	11.00 –12.50

Note: Viscous Neutrals, 15-25 p.p. generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils.

Bright Stock—Vis. at 210°		
200 Vis. D	19.00 (1)	18.00 (1)
150-160 Vis. D:		
0 to 10 p.p.	13.50 –16.00	13.50 –16.00
10 to 25 p.p.	13.00 –15.50	13.00 –15.50
25 to 40 p.p.	13.50–15.00 (2)	12.50–15.00 (2)
150–160 vis. E	12.50 –15.00	12.50 –15.00
120 Vis. D:		
0 to 10 p.p.	13.50 –15.50	12.50 –15.25
25 to 40 p.p.	—	14.375 (1)
600 S.R. Dark Green	7.00 (2)	7.00 (2)
600 S.R. Olive Green	8.00 – 9.50	8.00 – 9.50
631 S.R.	12.00 (1)	12.00 (1)
Black Oil	4.00–5.50 (2)	4.00–5.50 (2)

SOUTH TEXAS Neutral Oils

Vis.	Color		
Pale Oils: (*Vis. at 100°F*)			
100	No. 1½-2½	5.25 – 5.50	5.25 – 5.50
200	No. 2-3	7.25	7.25
300	No. 2-3	7.75	7.75
500	No. 2½-3½	8.50	8.50
750	No. 3-4	8.75	8.75
1200	No. 3-4	8.875	8.875
2000	No. 4	9.00	9.00
Red Oils:			
100	No. 5-6	5.25 –5.50 (2)	5.25 –5.50 (2)
200	No. 5-6	7.25	7.25
300	No. 5-6	7.75	7.75
500	No. 5-6	8.50	8.50
750	No. 5-6	8.75	8.75
1200	No. 5-6	8.875	8.875
2000	No. 5-6	9.00	9.00

CHICAGO (From Mid-Continent p.l. crude.)

Neutral Oils (Vis. at 100° F. 0 to 10 p.p.)

Pale Oils Vis.	Color		
60-85	No. 2	7.25 (1)	7.25 (1)
86-110	No. 2	7.25 (1)	7.25 (1)
150	No. 3	8.50 (1)	8.50 (1)
180	No. 3	9.50 (1)	9.50 (1)
200	No. 3	10.00 (1)	10.00 (1)
250	No. 3	11.00 (1)	11.00 (1)
Red Oils:			
180	No. 5	9.50 (1)	9.50 (1)
200	No. 5	9.50 (1)	9.50 (1)
250	No. 5	11.00 (1)	11.00 (1)
280	No. 5	12.00 (1)	12.00 (1)
300	No. 5	12.00 (1)	12.00 (1)

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower.

Unfiltered Steam Refined: (Viscosity at 210°)		
140	8.75 (1)	8.75 (1)
160	9.50 (1)	9.50 (1)
200	10.50 (1)	10.50 (1)
Bright stocks, 160 vis. at 210, No. 8 color:		
0 to 10 p.p.	15.00 (1)	15.00 (1)
15 to 25 p.p.	14.00 (1)	14.00 (1)
30 to 40 p.p.	13.50 (1)	13.50 (1)
E filtered Cyl. Stock	12.50 (1)	12.50 (1)

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

Natural Gasoline

(Group 3 & Breckenridge prices are to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

FOB GROUP 3				
Grade 26-70	2.875	(Sales)	2.625	(Sales)
FOB BRECKENRIDGE				
Grade 26-70	2.50	(Qtns.)	2.25–2.50	(Qtns)

CALIFORNIA (FOB plants in Los Angeles basin)

75-85, 350-375 e.p. for blending	4.375 –4.625	4.375 –4.625

Naphtha and Solvent

Prices Effective (FOB Group 3)	Mar. 31	Mar. 24
Stoddard solvent	5.50 – 5.875	5.50 – 5.875
Cleaners' naphtha	6.00 – 6.375	6.00 – 6.375
V. M. & P. naphtha	6.00 – 6.375	6.00 – 6.375
Mineral spirits	5.00 – 5.375	5.00 – 5.375
Rubber solvent	6.00 – 6.375	6.00 – 6.375
Lacquer diluent	6.25 – 7.375	6.25 – 7.375
Benzol Diluent	7.875– 8.375	7.875– 8.375
WESTERN PENNA		
Untreated naphtha	5.50 – 5.75	5.50 – 5.75
Stoddard solvent	6.00	6.00

OHIO (S. O. Ohio quotations for statewide delivery):

V.M.&P. naphtha, D.C. solvent	naphtha, Special Varnolene & Sohio	Varnolene,
	8.75	8.75
Rubber solvent	8.25	8.25

Wax

White Crude Scale:

WESTERN PENNA. (Bbls. C.L., N. Y.)		
122-124 A.m.p.	3.00 – 3.25	2.85 – 3.00
124-126 A.m.p.	3.00 – 3.25	2.85 – 3.00

OKLAHOMA (Bbls. or burlap bags, C.L.)

124-6 AMP.	3.25 (1)	3.00 (1)
131-3 AMP.	3.25 (1)	....

CHICAGO (FOB Chicago district refinery of one refiner, in bags or slabs loose, carloads. Melting points are F.MP (ASTM) methods; add 3° F. to convert into AMP.)

Fully refined:		
122-124 (bags only)	5.60	5.60
125-127	5.60	5.60
127-129	5.85	5.85
130-132	6.15	6.15
132-134	6.40	6.40
135-137	7.15	7.15

Petrolatums

WESTERN PENNA. (Bbls., carloads; tank cars, 0.5c per lb. less.)		
Snow White	5.125– 6.125	5.125– 6.125
Lily White	4.375– 5.125	4.375– 5.125
Cream White	3.625– 4.125	3.375– 4.125
Light Amber	2.625– 3.25	2.625– 3.25
Amber	2.375– 2.875	2.375– 2.875
Red	2.375– 2.75	2.25 – 2.625

Group 3 Freight Rates

To Division Headquarters Points of Standard Oil Co. of Indiana

	Gasoline Kerosine Cents per Cwt.	Gasoline Kerosine Cents per gal. 6.6 lbs.	Distillate-Gas Oil-Fuel Oil Cents per Cwt.	Distillate-Gas Oil-Fuel Oil Cents per gal. 7.4 lbs.
Chicago, Ill.	40	2.640	32	2.368
Decatur, Ill.	39	2.574	31	2.294
Joliet, Ill.	40	2.640	32	2.368
Peoria, Ill.	39	2.574	31	2.294
Quincy, Ill.	36	2.376	29	2.146
Indianapolis, Ind.	48	3.168	39	2.886
Evansville, Ind.	46	3.036	37	2.738
South Bend, Ind.	49	3.234	**42	**3.108
Detroit, Mich.	64	4.224	51	3.774
Grand Rapids, Mich.	58.5	3.861	**50	**3.700
Saginaw, Mich.	66	4.356	53	3.922
Green Bay, Wis.	51	3.366	41	3.034
Milwaukee, Wis.	43	2.838	34.5	2.553
LaCrosse, Wis.	46	3.036	37	2.738
Minneapolis-St. Paul	46	3.036	37	2.738
Duluth, Minn.	52	3.432	41.5	3.071
Mankato, Minn.	46	3.036	37	2.738
Des Moines, Ia.	36	2.376	29	2.146
Davenport, Ia.	39	2.574	31	2.294
Mason City, Ia.	42	2.772	33.5	2.479
St. Louis, Mo.	33	2.178	26.5	1.961
Kansas City, Mo.	28	1.848	22.5	1.665
St. Joseph, Mo.	28	1.848	22.5	1.665
Fargo, N. D.	63	4.158	50.5	3.737
Minot, N. D.	83	5.478	66.5	4.921
Huron, S. D.	53	3.498	42.5	3.145
Wichita				
From Ponca City	7.5	*0.495	7.5	†0.555
From Tulsa	12.5	*0.825	12.5	†0.925
From Cushing	11	*0.726	11	†0.814

*This rate also includes distillate rate at 6.6 lbs. per gal.

**This rate applies only to residual fuel and gas oil.

†This rate is exclusive of distillate which is based on 6.6 lbs. per gal. from Ponca City, Tulsa and Cushing, Okla., to Wichita. Includes only gas oil and fuel oil.

NOTE: There is no Group 3 rate to Wichita, Kans.

SEABOARD PRICES EXPORT AND COASTWISE

(NOTE—Parenthetical figures after prices indicate number of companies quoting when less than three companies are quoting.)

Atlantic Coast

(Prices are of refiners, FOB their refineries & their tanker terminals, & of tanker terminal operators, FOB their terminals)—Prices Effective Mar. 31

MOTOR GASOLINE

District:	Min. 80 Oct. '39 Research (Max. 2 cc. Lead)	72-74 Oct. (ASTM)	68-70 Oct. (ASTM)	65-67 Oct. ASTM)	60-64 Oct. (ASTM)
N. Y. Harb.	6.00 – 7.10	5.75 – 6.50	5.75 – 6.00	5.75–6.00 (2)	....
N. Y. Harb., barges	6.00 – 6.90	5.50 – 6.25	5.50 (2)	5.50–5.75 (2)	....
Albany	7.00	....	....	....	....
Philadelphia	6.00 – 7.50	5.75 – 6.25	5.75 – 7.00	6.75 (1)	....
Baltimore	6.00 – 6.75	6.00 (2)	5.75–6.00 (2)	5.75 (1)	....
Norfolk	6.00 – 7.25	6.00	6.00 – 6.75	5.50–5.75 (2)	....
Wilmington	6.00 – 7.25	6.00 (2)	5.875– 6.75	5.50–5.75 (2)	....
Charleston	6.50 – 6.75	6.00 (1)	6.00–6.25 (1)	5.75 (2)	....
Savannah	6.125– 6.75	6.00 (1)	5.875– 6.25	....	....
Jacksonville	6.125– 6.75	6.00 (1)	6.00 – 6.25	5.875 (1)	....
Miami	6.125–6.75 (2)	....	6.00 –6.25 (1)	5.25 (1)	....
Tampa	6.125– 6.75	6.00 (1)	6.00 –6.25 (2)	5.875 (1)	....
Pensacola	6.00–6.25 (1)	....	5.75 –6.00 (1)	....	....
Mobile	5.625–6.25 (2)	....	5.625–5.875 (1)	5.375 (1)	....
Portland	7.20	....	....	....	....
Boston	6.80 – 7.10	6.00–6.85	6.00 (1)	6.00 – 6.85	....
Providence	6.80 – 7.10	6.85–6.90	....	6.85 (1)	....

FUEL OILS

	KEROSINE and/or NO. 1 FUEL	No. 2	No. 3	No. 5	No. 6
N. Y. Harb.	4.80	4.20	4.20	$1.55	$1.25
N. Y. Harb., barges	4.70	4.10	4.10	....	....
Albany	5.10	4.60	4.60 (2)	$1.85 (1)	$1.45 (1)
Philadelphia	4.75 – 5.00	4.00 – 4.25	4.00 – 4.25	$1.37 –$1.47	$1.25
Baltimore	4.75	4.00 – 4.25	4.00 – 4.25	$1.47 (1)	$1.25
Norfolk	4.75 – 5.00	4.25	4.25 (2)	....	$1.25 (2)
Wilmington	4.75 – 5.00	4.25	....	....	....
Charleston	4.75 – 5.00	4.25 (2)	....	....	$1.20 (2)
Savannah	4.75 – 5.00	4.25 (1)	....	....	$1.20 (1)
Jacksonville	4.875– 5.00	4.25 (1)	4.25 (1)	....	$1.20 (1)
Miami	4.875–5.00 (2)	....	....	....	....
Tampa	4.75 – 5.00	4.25 (1)	....	....	$1.15 (1)
Pensacola	4.50–4.75 (1)	....	....	....	....
Mobile	4.50 – 4.75	....	....	....	....
Portland	5.00	4.60	4.60	$1.85 (1)	$1.25 –$1.45
Boston	4.90	4.50	4.50	$1.55 (2)	$1.25
Providence	4.90	4.50	4.50	$1.50 –$1.55	$1.25

	Bunker C Fuel Ships' bunkers (Ex Lighterage)	Diesel Oil Ships' bunkers (Ex Lighterage)	Diesel Oil Shore Plants	Gas House Gas Oil 28-34 Gravity
N. Y. Harbor	$1.25	$1.75	4.20 – 4.30 (2)	4.30 (2)
Albany	$1.45 (1)	$1.95 (1)	4.60 (1)	4.80 (1)
Philadelphia	$1.25	$1.75	....	....
Baltimore	$1.25	$1.75	4.25 (1)	4.25 (1)
Norfolk	$1.25	$1.75	4.25 (1)	4.25 (1)
Charleston	$1.20	$1.75	4.25 (1)	4.25 (1)
Savannah	$1.20 (1)	$1.89–$1.995 (2)	....	....
Jacksonville	$1.20	$1.89 –$1.995	....	....
Tampa	$1.15	$1.89 –$1.995	....	....
Portland	$1.25 –$1.45	$1.85 –$1.95	4.60 (1)	4.70 (1)
Boston	$1.25	$1.75	4.50 (2)	4.60 (2)
Providence	$1.25	$1.75	4.5 (1)	4.60 (1)

New York Export Lubes

(Penna. Products in bbls. FAS New York)

Prices Effective	Mar. 31	Mar. 24
Bright stock:		
Light, 25 p.t.	24.00(1)	24.00 (1)
Neutral oil:		
150 3 color, 25 p.t.	29.00 (1)	29.00 (1)
600 s.r., unfilt.	18.00 (1)	18.00 (1)
650 s.r., unfilt.	18.50 (1)	18.50 (1)
600 fl. s.r.	19.00 (1)	19.00 (1)
630 fl., s.r.	20.00 (1)	20.00 (1)

Wax

(Melting points are AMP, 3° higher than EMP. Export prices FAS c.l. Domestic prices FOB, in bags, c.l. Scale solid; fully refined slabs.)

Prices Effective Mar. 31

	New Orleans Export	N. Y. Domestic	N. Y. Export
Crude Scale:			
124-6 Yellow	3.00 (1)	....	3.00 (1)
122-4 White	....	3.00–3.25	3.00–3.25
124-6 White	3.00–3.25 (2)	3.00–3.25	3.00–3.25
Fully Refined:			
123-5	....	5.60 (a)	5.60 (2)
125-7	5.60(1)	5.60(a)	5.60
128-30	5.60(1)	5.60–5.70	5.60
130-2	5.85(1)	5.85	5.85
133-5	6.15(1)	6.15	6.15
135-7	6.40(1)	6.40(2)	6.40
108-11 White Match wax (tight bbls.)			3.50 (1)

Naphtha

Prices Effective Mar. 31	V.M.&P. Naphtha	Mineral Spirits
Baltimore	9.50 (2)	8.00
New York Harbor	9.50	8.50
Philadelphia district	10.00 (2)	8.00 – 9.00
Boston	9.00 (2)	8.75 – 9.25
Providence	9.00 (1)	8.75 (2)

Pacific Export

(Quotations at seaboard, Los Angeles, cargo lots, except where otherwise noted.)

Prices Effective	Mar. 31	Mar. 24
375 e.p. blend, 70 oct.	5.375–5.625	5.00 – 5.50
390 e.p. blend, 68 oct.	5.125–5.375	4.875–5.375
390 e.p. blend, 66 oct.	5.125–5.375	4.625–5.875
400 e.p. blend, 65 oct. min.	4.75 –5.125	4.50 – 4.75
U. S. Motor, under 65 octane	4.625– 5.00	4.375–4.625
38-40 grav. w.w. kero., 150 fire point	4.50 – 5.00	4.50 – 5.00
41-43 grav., w.w. kero.	4.75 – 5.00	4.75 – 5.00
44 grav., w.w. kero	5.00 – 5.50	5.00 – 5.50
Diesel fuel, 24 & above	$1.25 –$1.30	$1.25 –$1.30
Diesel fuel, under 24	$1.15 –$1.25	$1.15 –$1.25
30-34 grav. diesel (gas oil) Pac. Spec. 200	$1.25 –$1.35	$1.25 –$1.35
Grade C fuel, Pac. Spec. 400	$0.625–$0.75	$0.625–$0.75
In Ship's Bunkers, or deep tank lots:		
Diesel fuel, Pac. Spec. 200	$1.35 –$1.45	$1.35 –$1.45
Grade C fuel, Pac. Spec. 400	$0.70 –$0.75	$0.70 –$0.75

Pacific Export (Cont'd)

Prices Effective	Mar. 31	Mar. 24
Cased Goods: (Per case)		
U. S. Motor	$1.35 –$1.45	$1.35 – $1.45
375-400 e.p. blend, 65 oct. & above	$1.50 –$1.60	$1.50 –$1.60
400 e.p. blend, under 65 oct.	$1.40 –$1.50	$1.40 –$1.50
40-43 grav. w.w. kero., 150 fire point	$1.30 –$1.40	$1.30 –$1.40
Kero., p.w.	$1.25 –$1.35	$1.25 –$1.35

Tanker Rates

(Approximate rates. Cents per bbl.)

Gulf-N. Atlantic: (not E. of N.Y.)	Last Paid	Owners Ask
Hvy. Crude & Fuel (10 to 19.9 gravity)	55	..
Light Crude, (30 grav. or Lighter)	48	..
Gasoline	(a)	..
Kerosine	(a)	..
No. 2 Fuel	62	..

(a) No rate for gasoline or kerosene in last reported "clean" fixture.

Gulf Coast

(Prices for sales made or firm offers reliably reported for sales pending in cargoes FOB ship at Gulf, for minimum of 20,000 bbls. Prices are by refiners only to other refiners, export agents, or to large tanker terminal operators at the customary trade specifications noted.)

Prices Effective Mar. 31

Motor Gasoline Domestic	
Min. 80 oct. '39 Research, max. 2cc lead	5.25 – 5.75
60-62, Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	5.00 – 5.50
70 oct. unleaded "	5.25
68 oct. " "	5.00 – 5.25
65 oct. " "	4.75 –4.875
60 oct. " "	4.50
41-43 w.w. kerosine	3.25 – 3.50
No. 2 fuel	3.00 – 3.25
Gas Oil—Less than ½ of 1% sulfur.	
Below 43 diesel index	2.875– 3.00
43-47 " "	2.875– 3.125
48-52 " "	3.00 – 3.25
53-57 " "	3.25 – 3.50
58 & above diesel index	3.625– 3.75
Diesel Oil, ships' bunkers (ex-lighterage)	$1.35 –$1.50
Bunker C, " " "	$0.80 –$0.85
Bunker C, cargoes	$0.80 –$0.85
Motor Gasoline Export	
60-62 Gravity, Max. 400 e.p.	
72-74 oct. leaded (ASTM)	5.00 – 5.50
70 oct. unleaded "	5.25
68 oct. " "	5.00 – 5.25
65 oct. " "	4.75 –4.875
60 oct. " "	4.50
61-63 Gravity, Max. 390 e.p.	
72-74 oct. leaded (ASTM)	5.125
60 oct. unleaded "	....
64-66 Gravity, Max. 375 e.p.	
72-74 oct. leaded (ASTM)	5.125
60 oct. unleaded "	....
41-43 w.w. kerosine	3.25 – 3.50
Gas Oil—Less than ½ of 1% sulfur.	
Below 43 diesel index	2.875– 3.00
43-47 " "	2.875– 3.125
48-52 " "	3.00 – 3.25
53-57 " "	3.25 – 3.50
58 & above diesel index	3.625– 3.75

MID-CONTINENT LUBES

(At Gulf; in packages, FAS.; in bulk FOB terminals)

	Mar. 31 New Steel Drums	Bulk
200 vis. D. 210 brt. stock	25.80–26.30 (2)	19.80–20.30 (2)
150 vis. D 210 brt. stock 0-10 p.p.	21.80–22.30 (2)	15.80–16.30 (2)
10-25 p.p.	21.80 (1)	15.80 (1)
100 vis. D 210 brt. stock 0-10 p.p.	21.80 (1)	15.80 (1)
10-25 p.p.	21.30 (1)	15.30 (1)
200 vis. No. 3 col. neutral: 0-10 p.p.	17.00 (1)	11.30 (1)

SOUTH TEXAS LUBES

(Vis. at 100°, c. t. 0, blk exprt. shp., FOB terminals)

Unfiltered Pale Oils: Vis. Color	Mar. 31	Mar. 24
100 No. 3	6.00 (2)	6.00
200 No. 3	7.50 (2)	7.50
300 No. 3	8.00 (2)	8.00
500 No. 3½	9.00 (2)	9.00
750 No. 4	9.50 (2)	9.50
1200 No. 4	10.00 (2)	10.00
2000 No. 4	10.25 (1)	10.25
Red Oils: Vis. Color		
100 No. 5-6	6.00 (1)	6.00
200 No. 5-6	7.50 (2)	7.50
300 No. 5-6	8.00 (2)	8.00
500 No. 5-6	9.00 (2)	9.00
750 No. 5-6	9.50 (2)	9.50
1200 No. 5-6	10.00 (2)	10.00
2000 No. 5-6	10.25 (2)	10.25

(a) 0.4c discount generally given for slabs loose.

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1.5c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes. These prices in effect Mar. 31, 1941 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Esso (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	6.8	8.1	4.5	7.4
*Newark, N. J.	6.8	8.1	4.5	7.4
Annapolis, Md.	7.35	8.85	5.5	9.5
Baltimore, Md.	6.75	8.25	5.5	8
Cumberland, Md.	8.15	9.65	5.5	10
Washington, D. C.	7	8.5	3.5	9
Danville, Va.	7.95	10.45	6.5	9
Norfolk, Va.	6.75	9.25	6.5	9.5
Petersburg, Va.	7.05	9.55	6.5	10.5
Richmond, Va.	7.05	9.55	6.5	10.5
Roanoke, Va.	8.25	10.75	6.5	10
Charleston, W. Va.	7.55	10.05	6.5	11.5
Parkersburg, W. Va.	6.85	9.35	6.5	11.2
Wheeling, W. Va.	7.85	8.9	6.5	11.8
Charlotte, N. C.	8.9	9	7.5	9.8
Hickory	9.45	10.95	7.5	9.7
Mt. Airy, N. C.	9.3	8.5	7.5	10.4
Raleigh, N. C.	8.65	9.5	7.5	9.7
Salisbury, N. C.	8.95	8	7.5	10.1
Charleston, S. C.	6.75	9.25	7.5	....
Columbia, S. C.	7.6	10.1	7.5	....
Spartanburg, S. C.	8.3	10.8	7.5	....

	Mineral Spirits T.W.	V.M.&P. T.W.
Newark, N. J.	10.5	14.5
Baltimore, Md.	15	....
Washington, D. C.	15	....

Fuel Oils—T.W.	No. 1	No. 2	No. 3
Atlantic City, N. J.	7.4	6.2	6.2
Newark	7.4	6.2	6.2
Annapolis, Md.	....	6.5	....
Baltimore	7	6.25	5.75
Washington, D. C.	7.6	6.75	6.75
Norfolk, Va.	7	6	6
Petersburg	7.25	6.25	....
Richmond	7.25	6.25	6.25
Charlotte, N. C.	8.8	7.6	....
Hickory	....	7.25	....
Raleigh	8.7	7.3	....
Charleston, S. C.	....	6.3	....
Columbia	....	7.3	....
Spartanburg	....	8	....

*Effective March 4, '41, minimum retail resale price of 10.9c posted thru New Jersey.

Discounts:

Esso gasoline—to undivided dealers, 0.5c off dealer t.w. price, thru territory, except New Jersey. While above posted prices continue at Atlantic City and Newark, dealers will pay net price of 7.8c per gal. for Esso; dealers having pumps marked only Esso, Esso Extra and Standard White gasoline will pay 7.3c per gal. for Esso.

Kerosene—1c off t.w. price for 25 gals. or more, under contract thru territory (Baltimore city contract not necessary) except no discount in state of New Jersey.

Naphthas—To buyers taking following quantities at one time: Newark, 2c per gal. on 200 gals. or more, less than 200 gals. 0.5c higher price: Baltimore, 2c off on 25 to 100 gals. and 3c on over 100 gals.; Washington, 2c off to contract buyers.

Socony-Vacuum Oil Co., Inc.

Socony Mobilgas (*Regular Grade*)

	Com. T.C.	Com. Cons. T.W.	Undiv. Dlr. T.W.	Gasoline Taxes
New York City:				
Manhattan & Bronx	7.3	7	7.5	*5.5
Kings & Queens	7.3	7	7.5	*5.5
Richmond	7.3	7	7.5	*5.5
Albany, N. Y.	7.6	7.3	7.8	5.5
Binghamton, N. Y.	8.6	8.3	8.8	5.5
Buffalo, N. Y.	8	7.7	8.2	5.5
Jamestown, N. Y.	7.8	7.5	8	5.5
Plattsburg, N. Y.	8.6	8.3	8.8	5.5
Rochester, N. Y.	8.3	8	8.5	5.5
Syracuse, N. Y.	7.5	7.2	7.7	5.5
Bridgeport, Conn.	7.7	7.4	7.9	4.5
Danbury, Conn.	8.2	7.9	8.4	4.5
Hartford, Conn.	8.3	8	8.5	4.5
New Haven, Conn.	7.7	7.4	7.9	4.5
Bangor, Me.	7.6	7.3	8.6	5.5
Portland, Me.	7.2	6.9	8.2	5.5
Boston, Mass.	7.1	6.8	7.3	4.5
Concord, N. H.	8.6	8.3	8.8	5.5
Lancaster, N. H.	9.7	9.4	9.9	5.5
Manchester, N. H.	8.3	7	7.5	5.5
Providence, R. I.	7.1	7.1	7.9	4.5
Burlington, Vt.	8.6	8.3	8.8	5.5
Rutland, Vt.	8.7	8.4	8.9	5.5

	Mineral Spirits T.W.	V.M.&.P. T.W.
Buffalo, N. Y.	9.6	10.3
†New York City	9	10
Rochester, N. Y.	10.5	11.2
Syracuse, N. Y.	11.3	....
Boston, Mass.	11	11
Bridgeport, Conn.	11.5	12
Hartford, Conn.	11	11.5
Providence, R. I.	11	12

	Kerosine Yard	Kerosine TW	Mobilfuel Diesel TC	Mobilfuel Diesel TW	Mobilheat Fuel Yard	Mobilheat Fuel TW
New York:						
Manhat'n& Bronx	....	7.5	....	6.5	....	6
Kings & Queens	5	7.5	....	6.5	4.4	6
Richmond	5.1	7.7	....	6.5	4.5	6.2
Albany	5.3	7.3	4.8	6.8	4.8	6.5
Binghamton	7	9	....	....	6.3	7.8
Buffalo	6.2	8	5.7	7.7	5.5	7.2
Jamestown	5.9	8	....	....	5.9	7
Plattsburg	5.9	7.9	....	....	5.4	6.9
Rochester	6.6	8.6	....	....	5.8	7.3
Syracuse	6.5	8.5	....	....	6	7.5
Conn.:						
Bridgeport	5.4	7.3	....	....	4.8	6
Danbury	5.9	7.8	....	....	5.4	6.5
Hartford	4.9	6.8	....	6.4	4.4	6.3
New Haven	4.8	6.8	....	....	4.8	6.3
Maine:						
Bangor	5.6	7.5	....	....	5.2	6.7
Portland	5.4	7.5	5	7	5	6.5
Mass.:						
Boston	5.3	7.5	4.9	6.9	4.9	6.5
N. H.:						
Concord	6.1	8.1	....	....	6	7.5
Lancaster	7.2	9.2	....	....	7	8.5
Manchester	6.2	8.5	....	....	5.7	7.2
R. I.:						
Providence	5.3	7.4	4.9	6.9	4.9	6.4
Vermont:						
Burlington	5.9	7.9	....	....	5.3	6.7
Rutland	6.1	8.1	....	....	5.5	7

*Plus 2% city sales tax computed at time of each sale.

†Prices apply to consumers only in quantities over 1000 gals. annually; for quantities under 1000 gals. annually, add 0.5c per gal.

Discounts: Gasoline—To undivided dealers, 0.5c less than divided dealer t.w. Diesel—On t.w. deliveries, 0.5c for at least 400 gals.; 1c for full tank truck.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commercial T.C.	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	7	8	5.5	9.5
Pittsburgh	7.5	9.5	5.5	10.5
Allentown	7.5	9	5.5	10.5
Erie	7	9.5	5.5	10
Scranton	7.5	9	5.5	10.5
Altoona	7.5	9.5	5.5	10.5
Emporium	7.5	9.5	5.5	10.5
Indiana	7.5	9.5	5.5	10.5
Uniontown	7.5	9.5	5.5	10.5
Harrisburg	7.5	9	5.5	10.5
Williamsport	7.5	9	5.5	10
Dover, Del.	....	8.5	5.5	10.5
Wilmington, Del.	....	8	5.5	10
Boston, Mass.	....	7.8	4.5	7.5
Springfield, Mass.	....	9	4.5	8.6
Worcester, Mass.	....	8.5	4.5	7.5
Fall River, Mass.	....	8.4	4.5	8.1
Hartford, Conn.	....	9	4.5	7.8
New Haven, Conn.	....	8.4	4.5	8.4
Providence, R. I.	....	8.4	4.5	8.1
Atlantic City N. J.	....	7.8	4.5	7.4
Camden, N. J.	....	7.8	4.5	7.4
Trenton, N. J.	....	7.8	4.5	7.4
Annapolis, Md.	....	8.85	5.5	8
Baltimore, Md.	....	8.25	5.5	7
Hagerstown, Md.	....	9.35	5.5	7.6
Richmond, Va.	....	9.55	6.5	9.5
Wilmington, N. C.	....	9.35	7.5	9
Brunswick, Ga.	....	8.5	7.5	*9
Jacksonville, Fla.	....	8	8.5	10

	Mineral Spirits T.W.†	V.M.&P. T.W.†
Philadelphia, Pa.	12	14.5
Lancaster, Pa.	13.5	16
Pittsburgh, Pa.	14.5	14.5

Fuel Oils—T.W.	1	2	3	5	6
Phila., Pa.	7.5	6	6	4.25	3.50
Allentown, Pa.	8.5	6.5	6.5	....	....
Wilmington, Del.	8.00	6	6	....	....
Springfield, Mass.	8.6	6.4	6.4	....	....
Worcester, Mass.	7.5	6.7	6.7	....	....
Hartford, Conn.	7.8	6.2	6.2	....	....

*Does not include 1c Georgia kerosine tax.

†Mineral Spirits prices also apply to Stoddard Solvent; V.M.&P. prices also apply to Light Cleaners Naphtha.

Discounts:

Gasoline—to undivided dealers, 0.5c off dealer t.w., except Georgia & Florida dealer t.w. and undivided dealer t.w. prices are same.

Kerosine—Thru Penna. & Delaware, 2c off t.w. price on t.w. deliveries of 25 gals. or more at one time.

Naphthas—Philadelphia, 200 gals. or more at one time, 2c off, Lancaster, contract buyers taking 1000 gals. or more per year, one drum up, 2c off; non-contract buyers, 200 gals. or more at one time, 2c off. Pittsburgh, 500 gals. or more at one time, 2c off.

S. O. Ohio††

***Sohio X-70 Gasoline (*Regular Grade*)**

	Consumer T.W.	**Resellers	‡S.S.	Gasoline Taxes	†Kerosine T.W.
Ohio, Statewide	10.5	9	12.5	5.5	8
Akron	10.5	7.5	9.5	5.5	8
Cincinnati	10.5	7.5	10	5.5	8
Cleveland	10.5	8	11	5.5	8
Columbus	10.5	8	11	5.5	8
Dayton	10.5	7	9.5	5.5	8
Marietta	10.5	8	10.5	5.5	8
Portsmouth	10.5	8.5	11.5	5.5	8
Toledo	10.5	7.5	10	5.5	8
Youngstown	10.5	8	11	5.5	7.5

Aviation Gasoline—Statewide

	Consumer T.W.	Gasoline Taxes
Sohio Aviation	14.5	5.5
Esso Ethyl Aviation 74 Oct.	15.5	5.5
Esso Ethyl Aviation 80 Oct.	16.5	5.5
Esso Ethyl Aviation 87 Oct.	17.5	5.5
Esso Ethyl Aviation 90 Oct.	17.5	5.5
Esso Ethyl Aviation 100 Oct.	24.5	5.5

	†Naphthas—T.W. Statewide	Lucas County
S. R. Solvent	12.75	12.75
D.C. Naphtha	13.25	13
V.M.&P. Naphtha	13.25	13
Varnolene	13.25	13
Sohio Solvent	13.25	13

Fuel Oils—T.W.	No. 1	No. 2	No. 3	No. 4
Ohio, Statewide	7.5	7.5	7	....
Cleveland	9.5	9.5	9.0	6.75

*Renown (third-grade) prices are same as X-70 unless otherwise noted.

**Except authorized agents.

†Kerosine prices are ex 1c state tax. Naphtha prices are ex 1.5c federal & 4c state tax.

‡Prices at company-operated stations.

††Statewide prices are subject to exceptions other than those shown.

Discounts:

Esso aviation—on contract to hangar operators and resellers, 2c off consumer t.w.

Fuel Oils—Statewide prices are for t.w. & drum deliveries of 50 gals. or more; prices for deliveries of less than 50 gals. are 0.5c higher. Cleveland Nos. 1, 2, and 3 prices are for bulk deliveries of 5 to 99 gals.; 100 gals. and over are 2c less. Cleveland No. 4 price is for full compartment hose dump only.

Naphthas—to contract consumers off t.w. prices—Statewide: 300 to 999 gals., 0.5c; 1000 to 2499 gals., 0.75c; 2500 to 4999 gals., 1c; 5000 or more gals., 1.5c. Lucas County: Less than 50 gals., tank wagon price; 50 to 249 gals., 0.5c; 250 to 499 gals., 1c; 500 gals. or over, 1.5c.

S. O. Kentucky

Crown Gasoline (*Regular*)
Standard (*Third Grade*)

	†Net Dealer Crown	Standard	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	7	6.5	6.5	9
Lexington, Ky.	9	7	6.5	9
Louisville, Ky.	8.5	6.5	6.5	8.5
Paducah, Ky.	8	7	6.5	6.5
Jackson, Miss.	6.5	5.5	7.5	*8.5
Vicksburg, Miss.	8	7	7.5	*8
Birmingham, Ala.	8	7	*8.5	8
Mobile, Ala.	7.5	6	*9.5	8
Montgomery, Ala.	8.5	7.5	*9.5	*9
Atlanta, Ga.	9	8	7.5	*9
Augusta, Ga.	9	8	7.5	*8.5
Macon, Ga.	9	8	7.5	*8
Savannah, Ga.	8	7	7.5	*8
Jacksonville, Fla.	8	7	8.5	8
Miami, Fla.	8	7	8.5	8
Pensacola, Fla.	7.5	6.5	*9.5	8
Tampa, Fla.	8	7	8.5	8

*Taxes: In tax column are included these city and county gasoline taxes: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have 1c kerosine tax, Mississippi 0.5c, not included in above prices.

†Consumer t.w. prices are same as net dealer prices.

S. O. Indiana

Red Crown (*Regular Grade*)
Standard (*Third Grade*)

	Red Crown Cons. T.W.	Crown Dealer T.W.	Standard Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Chicago, Ill.	10.1	8.1	6.4	4.5	10
Decatur, Ill.	10.1	8.6	6.2	4.5	8.5
Joliet, Ill.	11.1	9.6	6.7	4.5	10
Peoria, Ill.	11.1	8.7	8.1	4.5	10
Quincy, Ill.	10.9	9.4	7.5	4.5	9.8
Indianapolis, Ind.	11.3	9.3	8.9	5.5	*10
Evansville, Ind.	11.1	8.9	8	5.5	*9.8

(Continued on next page)

TANK WAGON PRICES

Commercial or consumer tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1.5c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes where levied are indicated in footnotes. Dealer discounts are shown in footnotes. These prices in effect Mar. 31, 1941 as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. Indiana (Cont'd)

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Red Crown Cons. T.W.	Dealer Prices Red Crown	Stanolind	Gasoline Taxes	Kerosine T.W.
South Bend, Ind.	11.3	9.8	8.8	5.5	*10
Detroit, Mich.	9.6	8.1	7.1	4.5	8.1
Grand Rapids, Mich.	9.8	8.3	8	4.5	9.1
Saginaw, Mich.	10.4	8.9	8.4	4.5	9.1
Green Bay, Wis.	11.9	10.4	7.5	5.5	10.8
Milwaukee, Wis.	11.3	9.8	9.3	5.5	10.2
La Crosse, Wis.	11.5	10	9.5	5.5	10.4
Minneapolis-St. Paul	11.5	9.7	7.3	4.5	10.4
Duluth, Minn.	11.9	10.4	9.9	4.5	10.8
Mankato, Minn.	11.5	10	8.5	4.5	9.5
Des Moines, Ia.	10.9	9.4	7.9	4.5	*9.8
Davenport, Ia.	11.1	9.6	9.1	4.5	*10
Mason City, Ia.	11.3	9.8	6.9	4.5	*10.2
St. Louis, Mo.	10.2	8.7	7	*4.5	9.6
Kansas City, Mo.	10.4	7.4	6.4	*4.5	8.6
St. Joseph, Mo.	10.4	8.5	7.5	*4.5	8.4
Fargo, N. D.	12.7	11.2	9	5.5	11.6
Huron, S. D.	12	10.5	10	5.5	10.9
Wichita, Kans.	9.3	7.8	5.5	4.5	7.2

Stanavo Aviation 73 Octane

Chicago, Ill.	14.9		
Detroit, Mich.	16.5	4.5	
Milwaukee, Wis.	15.1	5.5	
Minneapolis, Minn.	15.3	4.5	
St. Louis, Mo.	14.5	*4.5	
Kansas City, Mo.	14.1	*4.5	
Fargo, N. D.	16.5	5.5	
Huron, S. D.	15.8	5.5	

	Oleum Spirits	V.M.&P. Naphtha	Stanisol	*Taxes
(Prices are base prices before discounts)				
Chicago	12.7	13	12.4	4.5
Detroit	15.2	14.2	15.7	4.5
K. C., Mo.	12.9	13.9	13.4	1.5
St. Louis	13.2	14.2	12.4	1.5
Milwaukee	13.8	14.8	14.3	5.5
Minneap'lis	14	15	12.7	4.5

	Fuel Oils T.W. Standard Heater Oil Chicago:
1-99 gals.	8.75
100-149 gals.	7.75
150 gals. & over	7.25

	Stanolex No. 1	Stanolex Furnace Oil
1-99 gals.	8.25	8.25
100-399 gals.	7.25	7.25
400 gals. & over	6.75	6.75

	Stanolex Fuel Oil A	Stanolex Fuel Oil B
1-399 gals.	6	6
400-799 gals.	5	5
800 gals. & over	4.75	4.75

	Stanolex Bunker C Fuel Oil
1-999 gals.	4.75
1000 gals. & over	3.75

Other Points:	Stanolex No. 1	Stanolex Furnace Oil
Indianapolis		
1-99 gals.	...	*8.5
100 gals. & over	...	*7.5
Detroit		
1-99 gals.	...	7.8
100 gals. & over	...	7.8
Milwaukee		
1-99 gals.	9.2	8.7
100 gals. & over	8.2	7.7
Minneapolis		
1-99 gals.	8.2	8.2
100 gals. & over		7.2
100-199 gals.	7.7	...
200 gals. & over	7.2	...
St. Louis		
1-99 gals.	8	7.5
100 gals. & over	7	6.5
Kansas City		
1-49 gals.	7.8	...
50 gals. & over	6.8	...
1-99 gals.	...	7.8
100 gals. & over	...	6.8

*Taxes: In gasoline tax column are included these city taxes—Kansas City, St. Joseph, and St. Louis, 1c. Indiana kerosine and fuel oil prices are ex 4c state tax: Iowa kerosine prices are ex 3c state tax. In naphtha tax column are included 1.5c federal tax and state taxes.

†Prices for small-lot deliveries range up to 2c higher than above prices.

S. O. Nebraska

Standard Red Crown Gasoline
(*Regular Grade*)

	T.W.	Dealer	Gasoline Taxes	Kerosine T.W.
Omaha	10.9	9.4	6.5	9.8
McCook	11	7.9	6.5	9.5
Norfolk	11	9.4	6.5	9.9
North Platte	11.3	9.5	6.5	10.2
Scottsbluff	11.4	8.5	6.5	10.8

S. O. Louisiana

Esso Gasoline (*Regular Grade*)

	Consumer Tank Car	Dealer T.w.	Gasoline Taxes	Kerosine T.W.
New Orleans, La.	5.75	8.25	8.5	*9
Baton Rouge, La.	6.25	8.75	8.5	*9.5
Alexandria, La.	6.25	8.75	8.5	*9.5
Lafayette, La.	6.5	9	8.5	*9
Lake Charles, La.	6.25	8.75	8.5	*9
Shreveport, La.	5.5	8	8.5	*9
Knoxville, Tenn.	9.5	11.5	8.5	12.5
Memphis, Tenn.	6.5	8.5	8.5	10.5
Chattanooga, Tenn.	9	8.85	8.5	11
Nashville, Tenn.	8.5	9	8.5	10
Bristol, Tenn.	9.75	9.75	8.5	12
Little Rock, Ark.	6.75	8.5	8	10

*Louisiana kerosine prices are ex 1c state tax.

Discounts:

Esso Gasoline—To individed dealers, 0.5c off dealer t.w.

Humble Oil & Refining Co.

Humble Motor Fuel (Regular Grade)
Thriftane (*Third Grade*)

	Humble *Tank Wagon	Humble Retail	Thriftane *Tank Wagon	Thriftane Retail	Gasoline Taxes
Dallas, Tex.	†6.5	9.5	†5.5	8	5.5
Ft. Worth, Tex.	6.5	10.5	5.5	8.5	5.5
Houston Tex.	7.5	11.5	5.5	8.5	5.5
San Antonio, Tex.	7.5	11.5	5.5	8.5	5.5

	Kerosine *Tank Wagon	Kerosine Retail
Dallas, Tex.	6	10
Ft. Worth, Tex.	7	11
Houston, Tex.	8	11
San Antonio, Tex.	7	11

74 Oct. Aviation Gasoline, Clear	Tank Car
FOB Baytown, Tex.	8.5

*To all classes of dealers & consumers.

†Discounts to dealers only: Humble 1c; Thriftane 0.5c.

The Texas Co.

	Gasoline—Dealer Fire-Chief (*Regular*)	T.W. Indian (*3rd Grade*)	Gasoline Taxes
Dallas, Tex.	6.5	5.5	5.5
Ft. Worth, Tex.	6.5	5.5	5.5
Wichita Falls, Tex.	7.5	5.5	5.5
Amarillo, Tex.	7.5	5.5	5.5
Tyler, Tex.	7.5	5.5	5.5
El Paso, Tex.	9	8	5.5
San Angelo, Tex.	7.5	5.5	5.5
Waco, Tex.	7.5	5.5	5.5
Austin, Tex.	7.5	5.5	5.5
Houston, Tex.	7.5	5.5	5.5
San Antonio, Tex.	7.5	5.5	5.5
Port Arthur, Tex.	7.5	5.5	5.5

Continental Oil

	Conoco Bronz-z-z (*Regular*) †Tank Wagon	Demand (*3rd Grade*)	Gasoline Taxes	Kerosine T.W.
Denver, Col.	9	8	5.5	10.5
Grand Junction, Col.	11	10	5.5	12
Pueblo, Col.	7.5	6.5	5.5	9
Casper, Wyo.	11	10	5.5	11.5
Cheyenne, Wyo.	9	8	5.5	11
Billings, Mont.	11	10	6.5	12
Butte, Mont.	10	9	6.5	13
Great Falls, Mont.	10	9	6.5	12
Helena, Mont.	10	9	6.5	12.5
Salt Lake City, Utah	10.5	9.5	5.5	14
Boise, Ida.	12.1	11.1	6.5	16
Twin Falls, Ida.	13.1	12.1	6.5	16.5
Albuquerque, N. M.	9	8	*7	9.5
Roswell, N. M.	7	6	*7	8
Santa Fe, N. M.	9.5	8.5	*7.5	9.5
Ft. Smith, Ark.	8	7.75	*5.5	6.5
Little Rock, Ark.	8	5.5	8	8
Texarkana, Ark.	8	6	*5.5	6
Muskogee, Okla.	6.5	5.5	5.5	7
Oklahoma City, Okla.	6	5.5	5.5	6.5
Tulsa, Okla.	7	6	5.5	6

*Taxes: In gasoline tax column are included these city taxes—Albuquerque, & Roswell, 0.5c; Santa Fe, 1c. Texas 4c state tax applies within city limits of Texarkana, Ark.; Okla. 4c state tax applies within city limits of Ft. Smith, Ark.

†To consumers & dealers.

Discounts: To dealers only — Cheyenne 1.5c on Bronz-z-z & Demand; Tulsa 1c on Bronz-z-z, 0.5c on Demand.

S. O. California

Standard Gasoline (*Regular Grade*)
Flight Gasoline (*Third Grade*)

	Standard Tank Truck	Standard Retail	Flight Tank Truck	Flight Retail	Gasoline Taxes
San Francisco, Cal.	12	13	10	11	4.5
Los Angeles, Cal.	11.5	12.5	9.5	10.5	4.5
Fresno, Cal.	13	14	11	12	4.5
Phoenix, Ariz.	14	15	11	12	6.5
Reno, Nev.	14	15	12	13	5.5
Portland, Ore.	12.5	13.5	10.5	11.5	6.5
Seattle, Wash.	12.5	13.5	10.5	11.5	6.5
Spokane, Wash.	14	15	12	13	6.5
Tacoma, Wash.	12.5	13.5	10.5	11.5	6.5

	Stanavo Tank Truck	Aviation Gasoline Taxes	Kerosine Tank Truck
San Francisco, Cal.	15.5	4.5	11.5
Los Angeles, Cal.	15	4.5	10
Fresno, Cal.	16.5	4.5	12.5
Phoenix, Ariz.	17.5	6.5	*12.5
Reno, Nev.	17.5	5.5	13.5
Portland, Ore.	16	6.5	13.5
Seattle, Wash.	16	6.5	13.5
Spokane, Wash.	19	6.5	16.5
Tacoma, Wash.	16	6.5	13.5

*Taxes: Phoenix kerosine price is ex 5c state tax.

Discounts:

To Resale & Commercial Consumers—3c off posted tank truck tax included price on Standard & Stanavo Aviation, 2c off on Flight. Deliveries less than 40 gals. to commercial consumer trade, 1c a gal. above posted tank truck tax included price, except single deliveries to Marine trade only which are billed at posted tank truck tax included price less 3c for Standard & Stanavo Aviation, and less 2c for Flight.

Kerosine—Tank car and truck & trailer deliveries, 3c off posted tank truck price; plant stem deliveries to jobbers, 2.5c off posted tank truck price.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline (*Regular Grade*)

	Gasoline T.W.	Gasoline Taxes	Kerosine T.W.
Hamilton, Ont.	16.5	8	17
Toronto, Ont.	16.5	8	17
Brandon, Man.	21	7	23
Winnipeg, Man.	20.5	7	22.5
Regina, Sask.	18	7	20
Saskatoon, Sask.	20.8	7	22.8
Edmonton, Alta.	18.9	7	20.9
Calgary, Alta.	16	7	18
Vancouver, B. C.	16	7	23
Montreal, Que.	16	8	16.5
St. John, N. B.	14.50	10	18
Halifax, N. S.	14.50	10	18

Discounts: Gasoline—Maritime Provinces—undivided & divided dealers, t.w. price; British Columbia—undivided and divided dealers, 2c off t.w. price; balance of territory—undivided dealers, 1c off t.w. price, divided dealers, t.w. price.

Tank Wagon Price Changes

(These changes have been made in price tables)

S. O. New Jersey—Kerosine:
Atlantic City & Newark up 0.2c March 27.

Socony-Vacuum—Mobilgas:
Boston & Providence consumer t. c. & t. w. up 0.3c March 26; Manchester consumer t. w. cut 1c March 26.

S. O. Kentucky—Gasoline:
Crown & Standard up 1.5c March 24 at Atlanta & Macon; Crown & Standard up 0.5c March 24 at Augusta, Jacksonville, Miami, & Tampa.

S. O. Louisiana—Kerosine:
Memphis cut 0.5c March 22.

Humble Oil & Refining Co.—Gasoline:
Effective March 27 at Dallas: Humble s. s. cut 1c & dealers allowed 1c discount from posted t. w.; Thriftane s. s. cut 0.5c & dealers allowed 0.5c discount from posted t. w.

Continental Oil—Gasoline:
Bronz-z-z & Demand prices up 1c March 24 at all Montana points.
Pueblo Bronz-z-z cut 2.5c, Demand 1.5c, March 26.

CRUDE OIL PRICES

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN & CENTRAL STATES FIELDS

PENNSYLVANIA GRADE

Posted by Jos. Seep Purch. Agency (Jan. 27, '41)

Bradford-Allegany $2.30
Southwest Penna $1.95
Eureka (West Va.) $1.89
Corning, O. (Nov. 4, 1939) $1.12

Posted by Tide Water Assoc. Oil Co. (Jan. 27, '41)

Bradford-Allegany $2.30

Posted by The Pennzoil Co., (Jan. 27, '41)

National Transit $2.23*

Posted by Valvoline Pipe Lines (Jan. 27, 1941)

Bradford (Elk & McKean Counties, Pa.) $2.30
Warren, Forest, Venango, Clarion & Butler Counties, Pa. $2.23
Allegheny, Beaver, Washington & Greene Counties, Pa. $1.95
West Virginia $1.89
South Eastern Ohio $1.85

*Applies to Cochran, Franklin, Hamilton & Doolittle districts; prices in other lower districts range down to $2.18 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co. (Jan. 2, '41)

Midland, Midland County $1.22
Sherman, Clare-Freeman $1.17

Posted by Simrall Corp. (Jan. 2, '41)

Greendale, Porter, Vernon, Crystal & Wise $1.22
Buckeye, Bentley, Edenville, Beaverton & sweet crude type of Monitor $1.20
Freeman, Redding & Lincoln $1.17
West Branch-Arenac $1.02
Hamilton-Grout $1.07

Posted by Sohio Corp. (Michigan Division)

Traverse Crude in Allegan, Kent & Ottawa Cos., Bloomingdale & Columbia Twps. in Van Buren Co. (Jan. 16, '41) $1.23
Trenton Crude in Monroe Co. (Jan. 16, '41) $1.17

Posted by Bay Pipe Line Corp. (Jan. 2, '41)

Saginaw & Wise $1.22 — Buckeye & Bentley $1.20
Clare ..... $0.91 — Adams $1.05
Bay Distillate $1.48

ILLINOIS-INDIANA-KENTUCKY-OHIO

Posted by Sohio Corp.

Illinois Basin, including Griffin pool (Aug. 21,'40) $1.15
Carmi, Storms, Ill. area (Feb. 1, '41) 1.10
Birk City, Ky. area (Jan. 1, '41) 1.10
Corydon, Ky. area, Henderson (Jan. 1, '41) 1.10

Posted by Ohio Oil Co.

Illinois Basin (Aug. 21, '40) $1.15
Illinois & Western Indiana (Aug. 23, '40) 1.00

Posted by Carter Oil Co. (Aug. 21, '40)

Louden, Fayette Co. Ill. $1.15

Posted by Mohawk Oil Lines, Inc. (Aug. 21, '40)

So. Illinois heavy ..... $1.05 — Light $1.15

Posted by Ashland Oil & Transp. Co. Somerset oil in Ash. Lines, Ky.: (Aug. 21, '40)

Big Sandy River ..... $1.12 — Kentucky River $1.20

Posted by Owensboro-Ashland Co.

Owensboro, Ky. area (Aug. 21, '40) $1.10

Posted by Standard Oil Co. of Ohio

Lima, O. (Jan. 1, '41) $1.00

MID-CONTINENT

OKLAHOMA-KANSAS-NORTH TEXAS

(See below for companies posting and dates)

Gravity	Schedule No. 1	Schedule No. 2	Schedule No. 3	Schedule No. 4	Schedule No. 5
Below 21	$0.70	$0.60	....	....	$0.63
21-21.9	.72	.63	....	....	.65
22-22.9	.74	.66	....	....	.67
23-23.9	.76	.69	....	....	.69
24-24.9	.78	.72	....	....	.71
25-25.9	.80	.75	....	$0.58	.73
26-26.9	.82	.78	....	.63	.75
27-27.9	.84	.81	....	.68	.77
28-28.9	.86	.84	$0.86	.73	.79
29-29.9	.88	.87	.88	.78	.81
30-30.9	.90	.90	.90	.82	.83
31-31.9	.92	.92	.92	.86	.85
32-32.9	.94	.94	.94	.90	.87
33-33.9	.96	.96	.96	.96	.89
34-34.9	.98	.98	.98	.98	.91
35-35.9	1.00	1.00	1.00	1.00	.93
36-36.9	1.02	1.02	1.02	1.02	.95
37-37.9	1.04	1.04	1.04	1.04	.97
38-38.9	1.06	1.06	1.06	1.06	.99
39-39.9	1.08	1.08	1.08	1.08	1.01
40 & above	1.10	1.10	1.10	1.10	1.03

Above schedules posted by:

No. 1: S. O. Indiana Oct. 17, '38 in Okla. & Kans.

No. 2: Carter Oct. 13, '38 in Okla.; Magnolia Oct. 12, '38 in Okla.; Shell Oct. 22, '38 in Okla. & Kans.

No. 3: Continental Oct. 11, '38 in Okla. & Kans. with lowest grade Below 29; Texas Co. Oct. 12, '38 in Okla. & Kans.

No. 4: Sinclair-Prairie Aug. 31, '39 in Okla. & Kans.

No. 5: Stanolind Sept. 1, '40 in N. Texas; Continental Oct. 11, '38 in N. Texas; Texas Co. Oct. 12, '38 in N. & N. Central Texas; Magnolia Dec. 3, '38 in N. & N. Central Texas; Sinclair-Prairie July 16, '40 in Mexia & N. Central Texas. Texas Co.'s lowest grade is 28-28.9 at $0.79; Continental, Magnolia and Sinclair-Prairie postings begin with Below 29 at $0.79.

TEXAS & NEW MEXICO FIELDS

Posted by Humble Oil & Refining Co.—(March 29, 1941)

Gravity	Refugio	Texas Gulf Coast	Mirando	Anahuac	Dickinson	East Central Texas	West Central Texas	Panhandle, W. Texas & New Mex.	Hawkins, Texas
Below 20	$0.98	$0.96	$0.93	$0.88	$0.83	....	....	$0.60	$0.73
20-20.9	1.00	.98	.95	.90	.85	....	....	.62	.75
21-21.9	1.02	1.00	.97	.92	.87	....	....	.64	.77
22-22.9	1.04	1.02	.99	.94	.89	....	....	.66	.79
23-23.9	1.06	1.04	1.01	.96	.91	....	....	.68	.81
24-24.9	1.08	1.06	1.03	.98	.93	....	....	.70	.83
25 & above	....	....	....	....	....	....	....	....	.85
25-25.9	1.10	1.08	1.05	1.00	.95	$0.87	$0.78	.72	....
26-26.9	1.12	1.10	1.07	1.02	.97	.89	.80	.74	....
27-27.9	1.14	1.12	1.09	1.04	.99	.91	.82	.76	....
28-28.9	1.16	1.14	1.11	1.06	1.01	.93	.84	.78	....
29-29.9	1.18	1.16	1.13	1.08	1.03	.95	.86	.80	....
30-30.9	1.20	1.18	1.15	1.10	1.05	.97	.88	.82	....
31-31.9	1.22	1.20	1.17	1.12	1.07	.99	.90	.84	....
32-32.9	1.24	1.22	1.19	1.14	1.09	1.01	.92	.86	....
33-33.9	1.26	1.24	1.21	1.16	1.11	1.03	.94	.88	....
34-34.9	1.28	1.26	1.23	1.18	1.13	1.05	.96	.90	....
35-35.9	1.30	1.28	1.25	1.20	1.15	1.07	.98	.92	....
36-36.9	1.32	1.30	1.27	1.22	1.17	1.09	1.00	.94	....
37-37.9	1.34	1.32	1.29	1.24	1.19	1.11	1.02	.96	....
38-38.9	1.36	1.34	1.31	1.26	1.21	1.13	1.04	.98	....
39-39.9	1.38	1.36	1.33	1.28	1.23	1.15	1.06	1.00	....
40 & above	1.40	1.38	1.35	1.30	1.25	1.17	1.08	1.02	....

Refugio: Includes crude purchased in East White Point, Greta, Melon Creek, O'Connor-McFaddin, Plymouth, Saxet, Taft, & Tom O'Connor fields.

Texas Gulf Coast: Includes crude purchased in Amelia, Clear Lake, Goose Creek, Hastings Magnet, Mykawa, Mykawa New, Raccoon Bend, South Thompsons, Sugarland, Thompsons, & Webster fields.

Mirando: Includes crude purchased in Blanchard, Bridwell, Colorado, Comitas, Eagle Hill, Escobas, Fitzsimmons, Glen, Government Wells (North & South), Heyser, Hoffman, Kelsey, Kohler, Loma Novia, Lundell, Manila, Mirando Valley, Placedo, Randado, Sarnosa, & Tesoro fields.

Anahuac: Includes crude purchased in Anahuac, Angleton, Cedar Point, Fishers' Reef, Hull (Old & New), Pierce Junction, Red Fish Reef, & Turtle Bay fields.

Dickinson: Includes crude purchased in Dickinson, Gillock, Hardin, League City, & Rowan fields.

East Central Texas: Includes crude purchased in Anderson, Cherokee, Limestone, & Navarro Counties, and Navarro Crossing field.

West Central Texas: Includes crude purchased in Brown, Callahan, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, & Throckmorton Counties.

Panhandle, West Texas, & New Mexico: Includes crude purchased in Carson, Gray, Hutchinson, & Wheeler Counties; Andrews, Crane, Crockett, Ector, Gaines, Glasscock, Howard, Reagan, Upton, Winkler, & Yoakum Counties, Texas; Lea County, N. M.

Hawkins: Includes crude purchased in Hawkins Field, Wood County, Texas.

Conroe $1.33
Tomball 1.30
Van 0.98
Talco 0.72
East Texas & Flag Lake $1.15
Flour Bluff, E.Flour Bluff 1.23
Salt Flat, N. Salt Flat 1.04
Darst Creek,Hilbig,Carroll 1.04
Clark, Zoboroski $1.04
Alice, Benavides (N. Sweden), Sun 1.25
Ben Bolt, Clark-Muil, Tom Graham 1.25
Yates (Pecos) 0.85

(Except where otherwise noted, references to Humble schedules shown below are to Humble schedules in NPN of March 26, 1941)

MAGNOLIA PETROLEUM CO.

Gray, Carson & Hutchinson Cos., Tex.—Dec. 3, '38—same as Humble.

Tomball, Tex.—Dec. 3, '38—same as Humble.

West Texas—Oct. 12, '38, in Crane, Glasscock, Howard, Mitchell, Upton & Winkler Cos. and Dec. 6, '40 in Cochran, Hockley, Yoakum & Gaines Cos.—same as Humble except Magnolia begins with Below 25 at $0.63.

N. Mexico—Oct. 15, '39, in Lea Co.—same as Humble except Magnolia begins with Below 25 at $0.63 and ends with 36 & above at $0.87.

Mirando, Tex.—Oct. 2, '39—same as Humble.

Beaumont, Tex.—Oct. 2, '39—same as Humble Texas Gulf Coast.

Cass & Panola Cos., Tex.—Oct. 12, '38—Below 25 grav. oil at $0.73, plus 2c per degree of gravity to top of 40 & above at $1.05.

Following Tex. postings Oct. 12, '38, except Talco Feb. 28, '41:

East Texas $1.10
Darst Creek ..... .96
Luling ..... .87
Lytton Springs ..... .99
Cleveland (Liberty Co.) $1.14
Hardin (Liberty Co.) 1.02
Talco 0.65

SINCLAIR-PRAIRIE OIL MARKETING CO.

Gray, Carson & Hutchinson Cos., Tex.—Aug. 31, '39—same as Humble.

West Texas & Lea Co., N. Mex.—Aug. 31, '39—same as Humble, except Sinclair begins with Below 25 at $0.63 and ends with 36 & above at $0.87.

Texas Gulf Coast—Oct. 3, '39—same as Humble.

East Texas (Oct. 2, '39) $1.10
Eddy Co., N. Mex. (Aug. 31, '39) ..... .77
Long Lake, in Anderson, Leon & Freestone Cos., Tex. (Jan. 20, '40) $1.08

STANOLIND OIL PURCHASING CO.

Tomball & Satsuma, Tex.—March 1, '41—same as Humble except Stanolind begins with Below 23 at $0.95.

Clinton, Tex.—Oct. 3, '39—same as Humble Texas Gulf Coast except Stanolind begins with Below 21 at $0.88.

Fairbanks, N. Houston & Rosslyn, Tex.—March 1, '41—same as Humble Anahuac-Dickinson schedule.

STANOLIND OIL & GAS CO.

West Beaumont, Jefferson Co., Tex.—Oct. 2, '39—same as Humble Texas Gulf Coast.

THE TEXAS CO.

(Effective Oct. 2, '39)

Panhandle, Tex.—Sweet crude same as Humble's Gray Co. except Texaco begins with 34-34.9 at $0.84. Sour crude same as Humble's Carson & Hutchinson Cos. except Texaco begins with 34-34.9 at $0.79.

West Texas & Lea Co., N. Mex.—Same as Humble except Texaco begins with Below 26 at $0.65 and ends with 36 & above at $0.87.

Texas Gulf Coast—Same as Humble except Texaco ends with 34 & above at $1.16.

Mirando-Duval, Tex.—Same as Humble except Texaco ends with 28 & above at $1.04.

Refugio, Tex.—Same as Humble except Texaco ends with 28 & above at $1.09.

Following Tex. postings Oct. 2, '39,—except Hockley & Cochran Cos. March 1, '41.

East Texas $1.10
Darst Creek ..... .96
Hockley & Cochran Cos. ..... .70
Cass Co. $1.05
Conroe 1.27

SHELL OIL CO., INC.

West Texas & Lea Co., N. Mex.—Aug. 29, '39, & Yoakum Co., Tex. Sept. 1, '39—same as Humble except Shell ends with 36 & above at $0.87.

Fisher Co., Tex.—Aug. 29, '39—Below 25 grav. at $0.68, plus 2c per degree of gravity up to 40 & above at $1.00.

Following Tex. postings Oct. 5, '39:
East Texas $1.10
Livingston area, Polk Co. 1.10

Following Tex. postings Aug. 29, '39:
Pecos Co., except Yates Shallow pool $0.78
Pecos Co., Yates Shallow pool ..... .65

CONTINENTAL OIL CO.

Eddy Co., N. Mex.—Apr. 22, '40—Begins with Below 29 at $0.61, plus 2c per degree gravity up to 40 & above at $0.85.

Mirando, Tex.—Feb. 1, '41—same as Humble, except Continental begins with Below 21 at $0.88.

Alfred & Magnolia City, Tex. (Jim Wells Co.)—Jan. 1, '41—$1.08.

PAN AMERICAN PIPE LINE CO.

Hastings & So. Houston, Tex. crudes—Oct. 1, '40—same as Humble Texas Gulf Coast except Pan Am. begins with Below 21 at $0.88.

Cayuga, Anderson Co., Tex.—Oct. 2, '39—$0.78.

East Texas—Jan. 1, '41—$1.10.

CRUDE OIL PRICES *(Continued from preceding page)*

CALIFORNIA *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective March 12, 1941

Gravity	Signal Hill (Long Beach) and others*	Seal Beach	Huntington Beach	Inglewood	Playa Del Rey	Olinda Brea Canon	Athens-Rosecrans	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Greeley, Canal Wasco	Coles Levee	Mountain View and others**	Elk Hills, Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$0.65	$0.64	$0.63	$0.64	$0.65	$0.61	....	$0.65	$0.61	$0.61	$0.62	$0.63	....	....	....	$0.65	$0.65	$0.65	$0.65	....
15-15.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.65	.65	.65	.65	....
16-16.9	.65	.64	.63	.64	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.65	.65	.65	.65	....
17-17.9	.65	.64	.63	.68	.65	.61	....	.65	.61	.61	.62	.63	....	....	....	.65	.65	.65	.65	....
18-18.9	.65	.64	.63	.71	.65	.65	....	.68	.61	.61	.62	.63	....	....	....	.65	.65	.65	.65	....
19-19.9	.69	.64	.67	.75	.70	.69	....	.72	.61	.65	.62	.63	....	....	....	.65	.65	.67	.65	$0.65
20-20.9	.73	.64	.72	.79	.76	.74	....	.75	.65	.69	.62	.67	....	....	....	.65	.69	.70	.65	.65
21-21.9	.78	.64	.76	.82	.81	.78	....	.79	.69	.73	.62	.72	$0.63	....	....	.65	.74	.74	.67	.65
22-22.9	.82	.69	.81	.86	.86	.82	....	.82	.73	.77	.66	.76	.63	....	....	.68	.79	.78	.70	.65
23-23.9	.86	.75	.85	.89	.92	.86	$0.71	.86	.78	.82	.71	.81	.67	....	....	.71	.84	.82	.74	.68
24-24.9	.90	.80	.90	.93	.97	.90	.77	.89	.82	.86	.75	.85	.72	....	....	.75	.89	.86	.78	.71
25-25.9	.95	.86	.94	.96	1.02	.95	.82	.93	.86	.90	.80	.89	.77	....	....	.79	.94	.90	.82	.75
26-26.9	.99	.91	.99	1.00	1.08	.99	.88	.96	.90	.94	.84	.94	.82	....	....	.83	.99	.95	.85	....
27-27.9	1.03	.97	1.03	1.04	....	1.03	.94	1.00	.94	.98	.89	.98	.87	$0.83	$0.92	.87	1.04	.99	.89	....
28-28.9	1.07	1.02	1.07	1.07	....	1.07	.99	1.03	.98	....	.93	1.02	.91	.86	.95	.91	1.09	1.03	.92	....
29-29.9	1.10	1.07	1.11	1.10	....	1.10	1.04	1.06	1.02	....	.98	1.06	.96	.89	.97	.95	1.14	1.07	.94	....
30-30.9	1.14	1.12	1.15	1.14	....	1.14	1.09	1.09	....	....	1.02	1.10	1.01	.92	.99	.99	1.19	1.11	.97	....
31-31.9	....	....	....	1.17		1.17	1.14	Elwood Terrace			1.07	1.14	1.05	.95	1.02	1.02	....	....	.99	....
32-32.9	Kettleman Hills			1.20		1.20	1.19	F. O. B. ship.			1.11	1.18	1.09	.98	1.04	1.06	....	....	1.02	....
33-33.9	....	$1.04	....	....		....	1.24	....	$1.13	....	1.15	1.22	1.14	1.01	1.07	....	....	....	1.04	....
34-34.9	....	1.08	....	....		....	1.29	....	1.16	....	1.20	1.26	1.19	1.04	1.09	....	....	....	1.07	....
35-35.9	....	1.12	....	....		....	1.34	....	1.19	....	1.24	....	1.23	1.07	1.12	....	....	....	....	....
36-36.9	....	1.15	....	....		....	1.39	....	....	....	1.28	....	1.27	1.10	1.14	....	....	....	....	....
37-37.9	....	1.19	....	....		....	1.44	....	....	....	1.33	....	1.31	1.13	1.16	....	....	....	....	....
38-38.9	....	....	....	....		....	1.49	....	....	....	1.37	....	1.36	1.16	1.19	....	....	....	....	....
39-39.9	....	....	....	....		....	1.54	....	....	....	1.42	....	....	1.19	....	....	....	....	....	....
40-40.9	....	....	....	....		....	1.59	....	....	....	1.46	....	....	....	....	....	....	....	....	....
41-41.9	....	....	....	....		....	....	....	....	....	1.50	....	....	....	....	....	....	....	....	....
42-42.9	....	....	....	....		....	....	....	....	....	1.54	....	....	....	....	....	....	....	....	....
43-43.9	....	....	....	....		....	....	....	....	....	1.59	....	....	....	....	....	....	....	....	....
44-44.9	....	....	....	....		....	....	....	....	....	1.63	....	....	....	....	....	....	....	....	....
45-45.9	....	....	....	....		....	....	....	....	....	1.67	....	....	....	....	....	....	....	....	....
46-46.9	....	....	....	....		....	....	....	....	....	1.71	....	....	....	....	....	....	....	....	....
47-47.9	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
48-48.9	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

FOB Standard Pipeline

*El Segundo prices same as Signal Hill. Wilmington prices same as Signal Hill, except below 19 gravity prices are: 14-16.9, $0.60; 17-17.9, $0.62; 18-18.9, $0.64.
**Includes Newhall, McKittrick, Kern River, Round Mountain and Kern Front, schedule for which ends with 19-19.9. Mountain View schedule begins with 19-19.9.

LOUISIANA-ARKANSAS

Posted by S. O. Louisiana, Oct. 17, '40

Gravity	Bunkie, La. etc.	Caddo, La. etc.	Darrow, La. etc.	University, La. (Baton Rouge)	Atlanta, Ark. etc.
Below 21	....	....	$0.75	$0.91	$0.55
21-21.9	....	....	.77	.93	.57
22-22.9	....	....	.79	.95	.59
23-23.9	....	....	.81	.97	.61
24-24.9	....	....	.83	.99	.63
Below 25	$0.83	$0.73	....	....	....
25-25.9	.85	.75	.85	1.01	.65
26-26.9	.87	.77	.87	1.03	.67
27-27.9	.89	.79	.89	1.05	.69
28-28.9	.91	.81	.91	1.07	.71
29-29.9	.93	.83	.93	1.09	.73
30-30.9	.95	.85	.95	1.11	.75
31-31.9	.97	.87	.97	1.13	.77
32-32.9	.99	.89	.99	1.15	.79
33-33.9	1.01	.91	1.01	1.17	.81
34-34.9	1.03	.93	1.03	1.19	.83
35-35.9	1.04	.94	1.04	1.20	.84
36-36.9	1.05	.95	1.05	1.21	.85
37-37.9	1.06	.96	1.06	1.22	.86
38-38.9	1.07	.97	1.07	1.23	.87
39-39.9	1.08	.98	1.08	1.24	.88
40 & above	1.09	.99	1.09	1.25	.89

Bunkie, La. schedule includes Eola and Olla, La.

Caddo, La. schedule includes De Soto, Homer, Sabine & Sugar Creek, La., Fouke & Miller County, Ark.

Darrow, La. schedule includes, Bayou des Glaise, Bayou, Mallet, Choctaw, Jeanerette, Lirette, No. Crowley, Port Barre, Potash, Roanoke & St. Martinville, La.

Atlanta, Ark. schedule includes Buckner, Magnolia, Village & Schuler (Jones Sand Oil), Ark.

Cotton Valley:
Crude.....$1.05
Distillate.....1.10
Holloway Sand
Crude.....1.10
Rodessa.....$1.05
Shreveport (Cross Lake).....1.05
Smackover (Heavy) .73
Dorcheat, Big Creek, & McKamie (Sour Distillates).....95

(Continued in next column)

LOUISIANA-ARKANSAS (Cont'd)

Posted by Shell Oil Co., Inc. (Aug. 29, '39)
Iowa District, La.

Below 18.	$0.75	23-23.9..	$0.89	29-29.9..	$1.04
18-18.9..	.77	24-24.9..	.92	30-30.9..	1.06
19-19.9..	.79	25-25.9..	.95	31-31.9..	1.08
20-20.9..	.81	26-26.9..	.98	32-32.9..	1.10
21-21.9..	.83	27-27.9..	1.00	33-33.9..	1.12
22-22.9..	.86	28-28.9..	1.02	34 & above	1.14

Black Bayou & White Castle Districts, La.—same as Iowa District, except Black Bayou, etc. begins with Below 20 at $0.79.

Gibson Field, Terrebonne Parish, La.....$1.04
Happytown Field, St. Martin, Parish, La.
(Jan. 12, '40).....1.00

Posted by Arkansas Fuel Oil Corp.
Urania, La. (Jan. 3, '41).....$0.95

Posted by Continental Oil Co.
Tepetate & Ville Platte, La. (Oct. 11, '38)....$1.03

Abbeville, La. (Jan. 1, '39)

Below 36.	$0.92	37-37.9..	$0.96	39-39.9..	$1.00
36-36.9..	.94	38-38.9..	.98	40 & above	1.02

CANADIAN FIELDS

Posted by Imperial Oil Limited Western Ontario (Nov. 6, 1939)
Petrolia.....$2.10 Oil Springs.....$2.17

Turner Valley Crude Oil (Sept. 12, '40)
(Prices FOB producer's tankage)

33-33.9..	$1.08	44-44.9..	$1.30	55-55.9..	$1.52
34-34.9..	1.10	45-45.9..	1.32	56-56.9..	1.54
35-35.9..	1.12	46-46.9..	1.34	57-57.9..	1.56
36-36.9..	1.14	47-47.9..	1.36	58-58.9..	1.58
37-37.9..	1.16	48-48.9..	1.38	59-59.9..	1.60
38-38.9..	1.18	49-49.9..	1.40	60-60.9..	1.62
39-39.9..	1.20	50-50.9..	1.42	61-61.9..	1.64
40-40.9..	1.22	51-51.9..	1.44	62-62.9..	1.66
41-41.9..	1.24	52-52.9..	1.46	63-63.9..	1.68
42-42.9..	1.26	53-53.9..	1.48	64 & over	1.70
43-43.9..	1.28	54-54.9..	1.50		

Absorption Gasoline (Jan. 5, 1938)
90% Rec., 20 lb. Reid v.p.....$1.94
90% Rec. 17 lb. Reid v.p.....$2.08

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co. (Oct. 11, '38, except Tensleep crude Feb. 1, '41)
Salt Creek (except Tensleep crude), Midway & Dutton Creek, Wyo.

Below 29.	$0.86	32-32.9..	$0.94	36-36.9..	$1.02
29-29.9..	.88	33-33.9..	.96	37-37.9..	1.04
30-30.9..	.90	34-34.9..	.98	38-38.9..	1.06
31-31.9..	.92	35-35.9..	1.00	39-39.9..	1.08
				40 & above	1.10

Wyoming:
Tensleep Crude....$0.6515
Frannie Light.....55
Frannie Heavy.....42
Hamilton Dome...35

Wyoming:
Grass Creek Light $0.90
Grass Creek Heavy .40
Elk Basin.....90
Iles, Colo.....92

Posted by S. O. Indiana (June 5, '39)
Lance Creek, Wyo.....$0.77

Posted by Ohio Oil Co. (Oct. 11, '38)
Elk Basin, Wyo.....$0.90
Grass Creek, Wyo. Light.....90
Rock Creek, Wyo.....1.00
Lance Creek, Wyo.....77
Dry Creek, Mont.....92
Sunburst, Mont. (Nov. 16, '37).....90

Posted by Continental Oil Co. (Oct. 11, '38) Ft. Collins & Wellington, Col.

Below 29.	$0.81	32-32.9..	$0.89	36-36.9..	$0.97
29-29.9..	.83	33-33.9..	.91	37-37.9..	.99
30-30.9..	.85	34-34.9..	.93	38-38.9..	1.01
31-31.9..	.87	35-35.9..	.95	39-39.9..	1.03
				40 & above	1.05

Canon City & Florence, Col.....$0.90
Cat Creek, Mont.. 1.10
Big Muddy, Wyo..$0.98
Lance Creek, Wyo. 0.77

CLASSIFIED

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Wanted Promotion man with experience in oil marketing to write and produce sales presentations, sales portfolios, broadsides and other direct mail. For company in Middle West. Preferably in his thirties. In applying please state education, experience, salary. Enclose recent photograph. Address Box 874, N. P. N.

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· PERSONALS ·

S. L. Heugly

Shirly L. Heugly, Salt Lake City, Utah. has been promoted to assistant secretary and general office manager of Paramount - Pingree Oil Co., announces **A. H. Ehler,** president. Mr. Heugly succeeds **J. N. Fraser** who resigned to take a position with a public accounting firm in Salt Lake City. Paramount's new official has been in the oil business 10 years.

* * *

R. O. Jones

R. O. Jones, Los Angeles, former assistant manager of foreign sales for Union Oil Co. of California, has been appointed general manager in charge of the company's operations in Central and South America, with headquarters in Panama City. Mr. Jones has been with Union since 1919.

* * *

O. H. Muller, Jr.

General sales manager of Douglas Oil & Refining Co., Los Angeles, is now **O. H. Muller, Jr.** Mr. Muller's 22 years experience in the oil industry includes service with the marketing division of Pure Oil Co. at Chicago, a directorship with Richfield Oil Co. and the presidency of Richfield Stations, Inc. Until recently, Mr. Muller was sales manager of Fletcher Oil Co., also in Los Angeles.

John Beman

John Beman is the new president of Pennzoil Co. of California, succeeding the late Norman M. Day who died this past February. With a background of many years experience as Pennzoil's chief counsel and a long service record in California's oil industry, Mr. Beman has been responsible for or instrumental in framing much constructive state, county and city legislation affecting the oil industry's refining and retail business. Mr. Beman is a graduate of Stanford University and an active law partner in the firm of Fogel and Beman.

* * *

Robert McKay, Saskatchewan, Canada, secretary-manager of Sask. Co-op Wholesale Society, is recovering slowly, reports the March 15 edition of The Saskatchewan Co-operative. Recently, Mr. McKay was operated on for an intestinal disorder, the paper said.

* * *

Leo Snyder, Enid, sales executive for Champlin Refining Co., has returned from San Antonio, Tex., where he attended graduation ceremonies at Brooks Field in which his son, John T. Snyder, was commissioned Second Lieutenant, Army Air Corps. Young Snyder has been transferred to Fort Benning, Ga., for active duty.

* * *

South Texas Chamber of Commerce honored **H. R. Cullen** of Houston as "guest of honor" at its annual oilmen's jubilee in San Antonio recently. Last year's jubilee honored **Al Buchanan,** San Antonio oil producer.

Mr. Cullen has been an active independent wildcatter since 1917 and has discovered numerous oil reserves for Texas. Originally a dealer in cotton, the Texan branched out into oil. During his spare time, he raises flowers. Known as a philanthropist and educator, the oilman and his wife were donors of the University of Houston's memorial building, given in memory of their son, Roy Gustav.

When the Fort Worth Exchange Club held its big Golden Deeds banquet, March 29, it conferred upon **Ed A. Landreth,** head of Landreth Production Corp., its 17th annual award of "Fort Worth's Outstanding Citizen for 1940." Member of the Board of Trustees for Texas Christian University, "Ed" follows the victories of TCU's football team in addition to other sports. He has discovered several substantial Texas oil fields and the cottages on his estate near Fort Worth are named after those discoveries. Oilmen remember the big barbecue he gave members of Independent Petroleum Assn. of America two years ago when it met at Ft. Worth.

* * *

Not giving full credit where full credit was due when we published a picture of **Paul Barlow** "amid shakers" on our March 19 Personals page, is an act to which we reluctantly plead "guilty". While Mr. Barlow helps his wife collect salt and pepper shakers from all over the world, it seems that this is **Mrs. Barlow's** hobby. She is shown below with the other half of the collection.

Mrs. Paul Barlow

Refining Technology

INCLUDING INTERNATIONAL PETROLEUM TECHNOLOGY

HYDROFORMING DEBUT

One more catalytic process is making its debut into the commercial world this week with an introduction in NATIONAL PETROLEUM NEWS. This is a new catalytic reforming process known as hydroforming, built by American Oil Co. at Texas City, Texas. The 7500-barrel unit now operating there is new evidence of the pioneering spirit of this company.

The Texas City refinery has three refining operations whose construction showed leadership in refinery construction. Two 40,000-barrel combination units are said to be the largest in the world. A catalytic polymerization unit which was among the first to be built is said to be about twice the size of the next largest in the U. S. The large hydroforming unit is the first of this type process to be built and it was built without first going through the usual semi-commercial stage of operation.

Only one other catalytic reforming process has been described before in any publication. Official announcements of catalytic cracking and reforming processes now include three processes, however, operating or under construction in commercial plant size.

Because of defense activities and censorship, the details of plant operation that would ordinarily be included in an article describing a new process have had to be omitted in the following description of the hydroforming process. Many of these details the authors were anxious to include with the article. These will have to be foregone until later except to the limited group who have the privilege of building this and other refinery processes which are of latest design. This censorship is also having its effect in the issuance of patents on refining processes so that patent disclosures are even farther behind than in the past in showing the advances in the art. Future developments will determine to what limits this censorship may be carried. Although many significant facts regarding the hydroforming operation are missing, there is still enough left to make an interesting account of this new catalytic reforming method.

★ ★ ★

RESEARCH VS. COMPETITION

The technical problems of the oil industry have been pushed out of their leading place in social importance by a subject which would have been of only academic interest a very few years ago, in the opinion of John D. Gill, well-known economist of The Atlantic Refining Co. The subject of validity of competition in the oil industry is now of most vital concern, he said at a recent meeting of the American Institute of Mining and Metallurgical Engineers.

It is quite easy to show enormous benefits accruing to the whole American economy from the rapid competitive exploitation of our petroleum resource, Mr. Gill said, but no one to his knowledge has attempted to show how greatly reduced would have been those benefits under governmental control and non-competitive exploitation of the resource. The reduction, he believes, would probably have greatly retarded our national growth.

A number of unanswerable but thought-provoking questions on technical development were raised by Mr. Gill which pointed toward the desirability of continuing with the competitive system. What would have taken place during the past 40 years under a government control board? Would such a board have done a better job? Where would it have begun its task of finding oil? When would the Board have begun to conserve the limited reserves of crude oil by searching for improvement in refining methods, such as the cracking process and how rapidly would it develop the process? Would it have known when a pool's contents were economically exhausted and have utilized reservoir pressures efficiently?

These are just a few of the questions that could be raised. Attempts to answer such questions inevitably lead back to the freedom of competitive method of development.

If the stimulation of economic necessity and the desire to increase profits had been eliminated in the oil industry, and not in related industries, it is conceivable that external competition, by development of processes for making motor fuel from coal, for example, would have advanced fast enough to have prevented development of the petroleum industry.

Mr. Gill pointed to the present trend of development of products made from materials practically limitless in supply, as indicated by advances in product synthesis, and said "the progress of invention alone, as in the synthesis of rubber and plastics, is a fundamental reason why crude oil hoarding is not true conservation and removes all support for the abandonment of the competitive principle in the oil industry."

★ ★ ★

NEW DIESEL RECORD

Diesel engine manufacture in 1940 again showed a remarkable increase according to a year-end summary by Diesel Power magazine. The year's sales in terms of horsepower totaled 3,400,000 hp., as near as it could be estimated from reports of manufacturers, as compared with 2,700,000 hp. in 1939, a 26% increase. This growth in diesel engine sales started in 1934 with sales totaling around 750,000 hp. and the best year prior to that was 1928 with sales of between 400,000 and 500,000 hp. The average sales for the past 5 years was a little over 2,300,000 hp. per year.

Most of the engines went into production plants. Tractor sales, particularly for contractor machinery, displayed the greatest increase, although railroad and bus fields held greater rates of increase, it is reported. The transportation field is considered as fast becoming a vital market for diesels. Unlike the situation in the gasoline-automobile field, the price of diesel accessories is reported not to be a determining factor. The user wants the best and is willing to pay the price.

New Catalytic Reforming Process Eas

By D. J. Smith[1] and L. W. Moore[2]

ABSTRACT

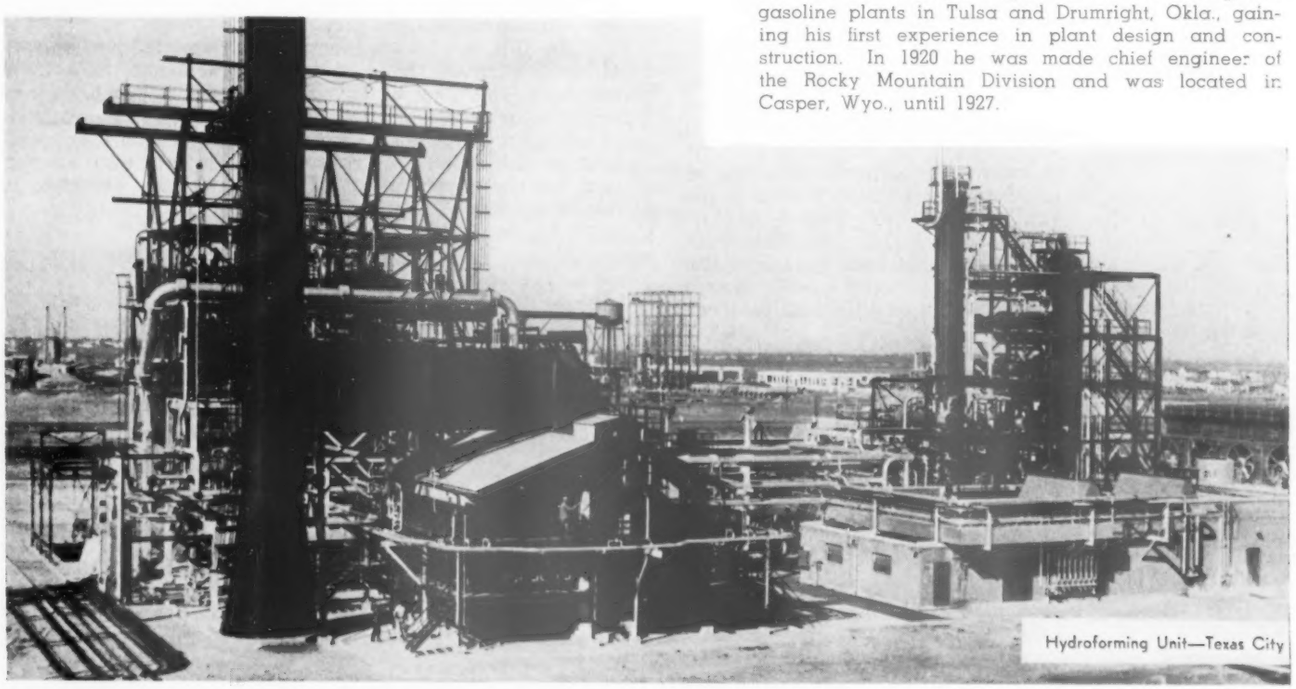
The hydroforming process, a catalytic reforming operation in the presence of hydrogen, is the newest catalytic refining process in commercial operation. A 7500-barrel unit at the Texas City refinery of American Oil Co. converts 40-45 octane naphtha into 80-octane (A.S.T.M.) gasoline with 80% yield of unusually stable motor fuel. High-grade aviation fuel can be produced by minor modifications in plant equipment or a product having upwards of 80% aromatics can be produced. The latter change would enable annual production of 5,000,000 gallons of toluene, 25% of U. S. production in 1939.

THE most recent addition to the growing family of catalytic petroleum refining processes now in commercial production is the hydroforming process, a catalytic reforming operation which takes place in the presence of hydrogen gas. The first unit was placed in operation recently by Pan American Refining Corp. at Texas City, Texas, for the conversion of 7500 barrels per day of 40-45 octane heavy virgin naphtha into 80 A. S. T. M. octane gasoline. The yield of high-octane gasoline is 80% of the charge.

The unit is designed to take all of the low octane heavy naphtha produced from the largest two cracking units in the world (capacity about 40,000 barrels per stream day each) in addition to small amounts of heavy naphtha pro-

[1]Vice president and [2]technical assistant, Pan American Refining Corp.

Donald J. Smith, vice president Pan American Refining Corp. since 1932, supervised the planning, design, and construction of the Texas City refinery and is in charge of its operation. In the planning of this refinery he had the advantage of similar experience between 1927 and 1932 in building Lago Oil & Transport Co. refinery at Aruba. During this period he was assistant general manager. Mr. Smith was born in Normal, Ill., graduated from high school in Chicago and received a degree in electrical engineering at the University of Illinois in 1914. After spending two years in engineering sales he went to work for Standard Oil Co. (Ind.) as superintendent of casinghead gasoline plants in Tulsa and Drumright, Okla., gaining his first experience in plant design and construction. In 1920 he was made chief engineer of the Rocky Mountain Division and was located in Casper, Wyo., until 1927.



The hydroforming unit of American Oil Co. at Texas City. In the foreground is the furnace and the catalyst cases are within the structure at the rear. On the right is the pump house with control on the second floor and the stabilizer and rerun tower are visible beyond the building

Easy to Convert to War Needs

duced from miscellaneous crude topping operations. The product from the Texas City plant will be blended into the principal grades of gasoline marketed by the American Oil Co.

Nature of the Process

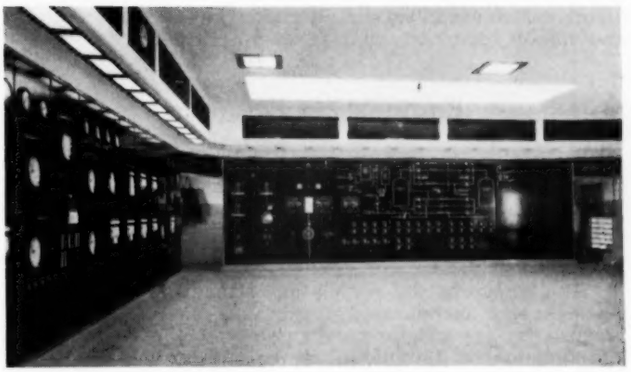
The installation of the hydroforming process also involved some pioneering in that the commercial scale plant was designed on the basis of laboratory experience from a small pilot plant before going through the stage of a semi-commercial pilot plant. Since the hydroforming process involves carrying on a reaction in the presence of hydrogen, it might appear that this process is closely related to the hydrogenation process. This is not the case, however. Hydrogenation reactions involve the addition of hydrogen to hydrocarbon molecules, wheras the net effect of the hydroforming process is to dehydrogenate, that is, to take hydrogen away from hydrocarbon molecules. Part of the hydrogen thus produced is recirculated with the fresh feed to control the rate and extent of the dehydrogenation reaction. The most important property of the hydroforming catalyst is that it causes ring-closure to occur along with dehydrogenation, so that the product contains a high percentage of aromatic hydrocarbons and only a small quantity of aliphatic unsaturates. Thus, the product is unusually stable, and, in the case of the Texas City plant, is blended directly into finished gasoline.

While the design of the Texas City plant presented some difficult engineering problems, the process flow is relatively simple as indicated by the accompanying flow diagram. The fresh feed, consisting of a 40-45 octane heavy naphtha, is preheated by heat exchange with hot reaction products and sent to a combination naphtha and recycle gas preheater furnace. A hydrogen-rich recycle gas stream from a gas separator is also preheated by heat exchange and sent through a separate coil in the preheater furnace which heats it to a high temperature. The two streams issuing from the furnace are then mixed and sent to the catalytic reactors which are under substantial pressure, the reforming reaction taking place in the vapor phase.

THE hot reaction products leaving the catalytic reactors are partially cooled by heat exchange with cold naphtha feed and other products. They are then cooled to normal temperature and sent to a gas separator. Part of the gas from the separator is used as recycle gas, and the balance goes to the refinery fuel system. This gas makes up 15% of the products of the hydroforming operation and since it contains only a small percentage of unsaturated hydrocarbons, is unsuited for polymerization charge stock. The furnace employed with the process uses about half of the gas produced.

The liquid from the gas separator is pumped to a stabilizer tower where the last traces of gas are removed, and then to a rerun tower where a small amount of heavy polymer is removed. The product from the rerun tower is sent to storage from which it is blended into finished gasoline. The heavy polymer, which is about 2% of the products of the process, is used as Bunker C fuel.

During the course of the hydroforming reaction, a small amount of coke is deposited on the catalyst. As the amount of coke deposited increases, the activity of the catalyst gradually decreases, so that it is necessary to re-



The control room for the hydroforming process. The flow diagram shows which catalyst case is operating and which is in regeneration

Contents . . .

REFINING TECHNOLOGY

April 2, 1941

The first unit of a new process for catalytic reforming, known as the hydroforming process, recently started operation at Texas City to produce 7500 barrels per day of 80-octane gasoline. Minor modifications will permit production of aviation fuel or 5,000,000 gallons annually of toluene **R-98**

Copper-lead bearing corrosion in bus and truck operation has become a problem of such concern to engine designers and lubricating oil engineers in the past year that more intensified efforts are being directed to solution of the problem than ever before. Oil company engineers see solution in better engine design and better bearings. Engine designers want better oils **R-104**

New Patents **R-112**

Advertisers' Index ..... **63 & R-111**

Other Editorial Index **5**

move a catalytic reactor from service periodically and burn the coke off in order to restore catalyst activity.

Burning is done by recirculating flue gas produced by a special flue gas generator, through the reactors, the rate of burning being controlled by adding small amounts of air to the flue gas. Reactivation is carried out at an elevated pressure and at carefully controlled temperatures. Since the reactivation takes place at a relatively slow rate, temperature can be controlled entirely by the flow of reactivating gases. The Texas City plant has two large catalytic reactors, which are in service alternately, one being on stream and one off for reactivation at all times.

Engineering Features

In designing the plant, care was taken to avoid thermal cracking of the naphtha before it contacts the catalyst. Thermal cracking of the naphtha is undesirable because it decreases both the yield and octane number, and results in excessive coke deposition.

The design of the recycle gas stream and reactivation systems was complicated from an economic standpoint because, for any given octane number level, coke deposition is a function of the amount of recycle gas and the hydrogen concentration of the recycle gas, and consequently the size of the reactivation system is dependent on the size of the recycle gas system. This problem, in addition to many others in connection with the design, was made more difficult by the fact that the process development did not go through the usual stages of pilot plant to semi-commercial to full scale design, as previously mentioned.

Operation of the reactivation system is entirely automatic and is controlled through a time-cycle mechanism. Because of the relatively long reactivation and on-stream periods, the time-cycle mechanism is used also to change conditions in the stabilizer tower thus compensating for variations in product volatility with change in catalyst activity. The life of the catalyst is yet to be determined. The length of time of operation of the unit has not yet been sufficient to estimate when it will have to be replaced.

In general, the equipment other than the catalyst chambers and their control equipment, are standard and of ordinary materials. The furnace is of Kellogg design with two coils as indicated by the simplified flow diagram. However, the hydrogen content of the gases circulating through the furnace requires that special alloy tubes be used. These are made of stabilized 18-8 stainless. The reactivating gas system has some interesting features among which is the centrifugal blower. This blower handles the high-temperature gas, operating at 6000 rpm. and at a pressure differential of 20 pounds psi. The unit also uses Kellogg's transfer line heat exchangers which are designed for unusually high temperatures for this class of equipment. These are constructed, however, of ordinary steel containing 0.5% molybdenum since the material going through them is not corrosive.

The accompanying picture of the hydroforming plant gives some idea of its size and, since some of the flow is in the gas phase, some of the piping is of large size. The plant, within the battery limits, occupies a ground area of 280 x 170 feet not including the cooling tower. The latter is of forced draft type having a capacity of 12,000 gallons per minute. By looking closely at the picture of the plant, two men may be seen in front of the unit, giving an idea of the height of the structure and towers.

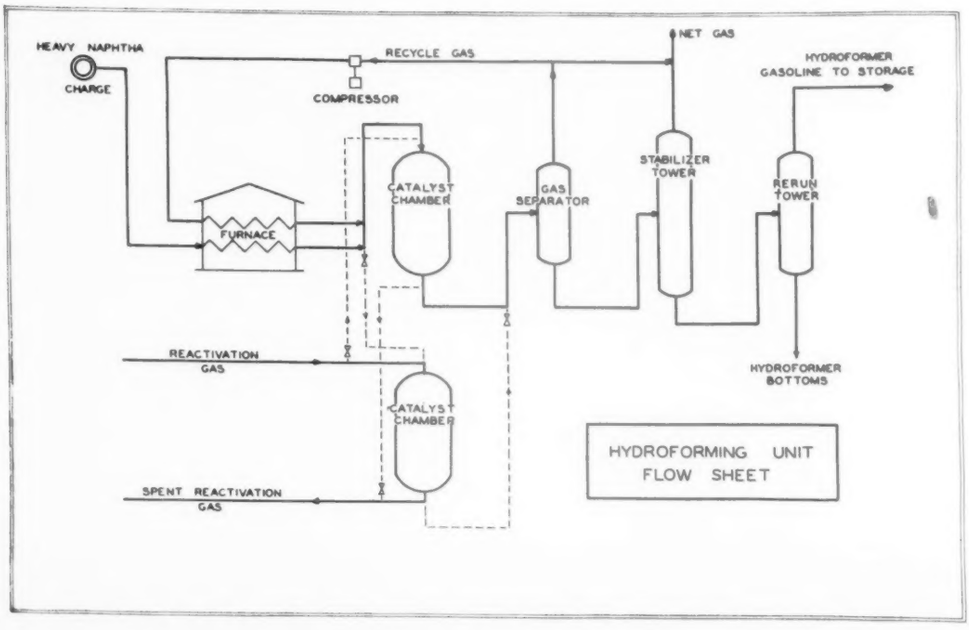
The utility requirements for operating this 7500-barrel unit are 42,000 pounds per hour of steam (maximum), 2000 Kw/hr., 8800 gallons per minute of cooling water, and 117,000,000 Btu./hr. for furnace operation. The operating crew consists of 7 men per shift.

Yields and Product Quality

Although the hydroforming process is sufficiently flexible to produce gasolines over a wide range of octane numbers up to 90 A. S. T. M., the conditions selected for the design of the Texas City plant were those which produce 80% of an 80 A. S. T. M. octane number gasoline. Typical charge and product inspections are as follows:

	Charge	Product
Gravity—°A.P.I.	51.4	51.3
Octane No.—A.S.T.M.	47.2	77.0
Reid V.P.	0.4	8.2
Initial Boiling Point °F.	222	99
10%	250	174
50%	292	270
90%	367	339
Max. °F.	436	368

The above inspections show substantial increases in octane number and volatility with a slight decrease in gravity, thus indicating the presence of aromatics in the product. Analysis shows the product to contain 40-50% of aromatics.



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From 15 to 20% of the aromatics present is toluene, most of the balance being xylenes and higher aromatics.

The anti-knock quality of hydroformed gasoline has not yet been thoroughly evaluated by road test, but indications are that the road octane number will be about the same as gasolines containing similar percentages of aromatic hydrocarbons. The A. S. T. M. blending octane value of hydroformed gasoline, when blended into a typical refinery base stock of 70 A. S. T. M. octane number averages one to two octane numbers higher than clear octane number in concentrations up to 25%.

While the most important application of the hydroforming process undoubtedly will be to produce high octane motor car gasolines, there are other features of the process which are of importance to pertoleum refiners. The process is sufficiently flexible so that either straight run or cracked gasolines may be reformed, and, in general, the product requires no treatment to render it suitable for the market, such as clay or doctor treating or addition of inhibitors.

By changing operating conditions, the hydroforming process can produce a high grade aviation gasoline, or can be modified to produce a product having upwards of 80% aromatics. This latter feature of the process is particularly important from a military standpoint, as it affords a means for substantially augmenting toluene production in this country. The total production of toluene in the United States was 20,000,000 gallons in 1939, but the toluene content of the product from the Texas City plant alone is equivalent to an annual production of 5,000,000 gallons, or about 25% of the total U. S. toluene production in 1939.

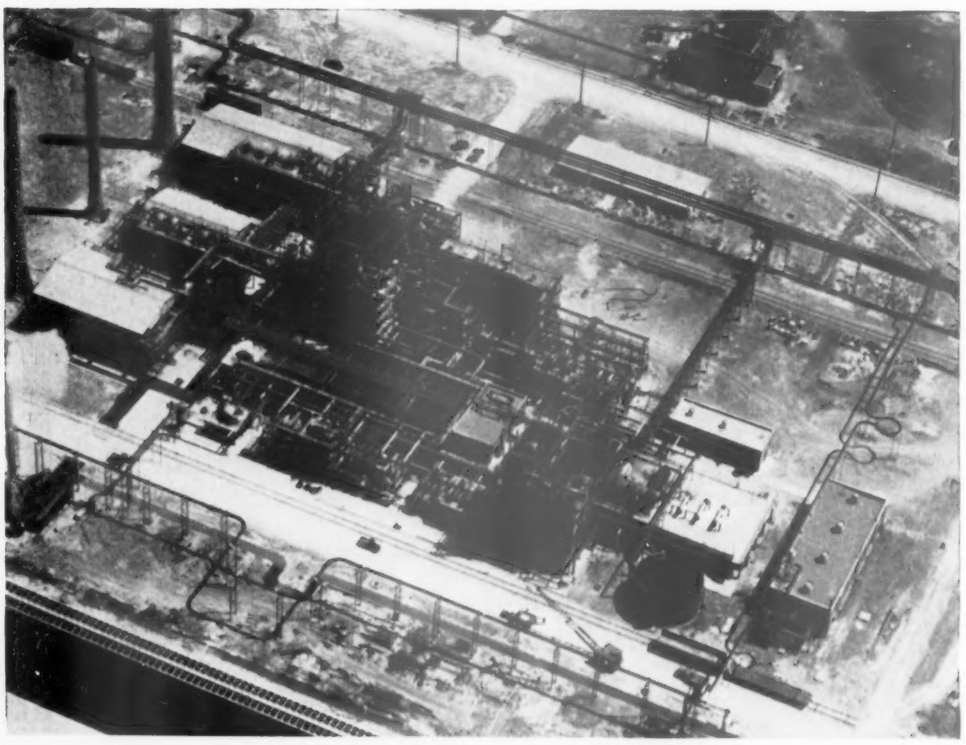
The hydroforming process, as installed, is a development of the research organizations of several companies, including, primarily, the M. W. Kellogg Co., Standard Oil Development Co., and Standard Oil Co. (Ind.). The design of the Texas City plant was carried out by engineers of the M. W. Kellogg Co. in collaboration with engineers of Pan American Refining Corp. and Standard Oil (Ind.). Construction work was done by M. W. Kellogg Co. The unit is being operated under patent license from Standard Catalytic Co., which has important patent rights for this and related processes.

Three Record-Sized Refining Processes at Texas City

The construction of the Texas City hydroforming plant carries out a pioneering spirit which has characterized the refining operations there since the construction was started in 1933. This refinery is the largest in the United States to build from the ground up in recent years. It afforded a rare opportunity in refinery planning of which full advantage was taken, based on the experience gained in building and operating the 285,000-barrel Aruba refinery, now operated by Standard of New Jersey.

Although no 40,000-barrel units had ever been built before there was no reason to doubt that a unit of this size would not function as well as one of smaller size. The first unit, a combination type, went into operation in 1934. When polymerization came into commercial significance, the Texas City refinery again pioneered by constructing a catalytic unit much larger than had been built up to that time. The 2500-barrel catalytic polymerization plant, on which construction was started in 1935, is still about twice as large as the next largest catalytic polymerization plant now in operation.

This plant was no more than completed until the second cracking unit was under construction, a duplicate of the number one unit, testifying to the success of cracking on this mammoth scale. Since then another cracking unit of 18,000 barrels capacity has been built. The accompanying airplane view of the plant in its present stage of operation shows the simplicity of plant layout of this nearly 100,000-barrel refinery which sets a high standard in orderliness. The refinery is unusual in another respect; that it has no tank car nor truck loading racks. All products are moved by tankship from the refinery.



One of two 40,000-barrel combination cracking units at the Texas City refinery of American Oil Co. which are the largest in the world

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Copper-Lead Bearing Corrosion Serious in Heavy-Duty Service

ABSTRACT

A bearing corrosion problem in heavy-duty engines of buses and trucks centering around copper-lead bearings has been a growing concern of three groups: operators, engine manufacturers, and oil company lubrication chemists and engineers. Many quality lubricating oils, including some thought to guard against corrosion, have been involved. No sure solution is yet in sight since more than one kind of corrosion appears to be involved. Better bearings, better engine design, better oils, and better maintenance and oil change practice are demanded by the three groups affected. Following are views of a number of engineers who are working on the solution of the problem.

A LUBRICATION problem and wave of crankshaft bearing corrosion trouble considered the most important in several years has come to a head as the result of the comparing of notes on bearing failures between operators of fleets of buses and trucks. The problem centers around the use of copper-lead bearings, now generally used in these vehicles and occurs under both high and low temperature conditions of operation. It has been found to be particularly serious in city bus operation.

Since the problem did not spring up overnight and has occurred with the lubricants of most if not all oil companies, including at least one oil guaranteed to prevent bearing corrosion, operators are skeptical of all proposed cures. The problem is apparently a complex one in which a number of factors are influential, it is pointed out by several oil company lubricating engineers.

Two different corrosion problems appear to be involved, some engineers now believe. One occurs at high temperature and the other at low temperature. The importance of low temperature to corrosion is a comparatively new finding although its effects in winter sludge formation are well known.

The corrosive agents differ in their effects on the bearing. The high temperature corrosion is thought to be the result of acids or corrosive compounds formed by oxidation of the lubricating oils or certain fractions of it which attack the lead in the copper-lead bearing. In the so-called cold corrosion there is no oil oxidation. It is thought to be the result of a moisture condition. Moisture resulting from fuel combustion condenses on the cylinder walls and carries with it sulfur dioxide coming from the traces of sulfur in the gasoline. These are carried into the crankcase from whence they are circulated to the bearings. The water and sulfur dioxide combine to form sulfurous acid which attacks the copper in the bearing, it is believed. This reaction may not be a direct attack but may depend upon prior attack on lead or upon the existence of fatigue cracks. This difference in corrosion is only detected by microscopic examination.

The above analysis is partially the result of experienced observation and contains some theorizing but until disproved it appears to be the most generally accepted explanation. Bearing fatigue is also considered a factor in that it tends to open microscopic cracks in the bearing into which corrosive materials in the lubricating oil may enter. Local hot spots due to raised spots on the bearing surface may also promote corrosion. Foreign solid materials may become imbedded in the bearing and promote in one way or another the starting of a corroded area.

Not a Motor Car Problem

The problem does not involve private passenger car operation, but is confined to heavy-duty vehicles where additional bearing strength is provided by use of the copper-lead bearing. The solution of the problem, in the opinions of many oil company engineers, is that there are a number of improvements which can be made, any one of which might relieve the trouble to some extent. The right combination of improvements in engine design, bearing installation or material, stricter attention by truck and bus operators to lubricant and lubricant-change recommendations of manufacturers, and use of additives in lubricating oil may be the complete solution of the problem. The use of additives has not been extended to fortifying an oil against acidic products coming from fuel combustion, however, according to one lubricant chemist.

Some oil company lubricating oil experts feel that the only solution is to go back to babbitt bearings, or at least to the highest quality of copper-lead bearings and improved methods of installation. Improved bearings of both types are available, as well as one or two other new types of bearings which are showing promise. The use of the term "improved" for bearings not thoroughly proven by one or two years of road service under the conditions in which copper-lead bearings have failed raises objections from several engine designers.

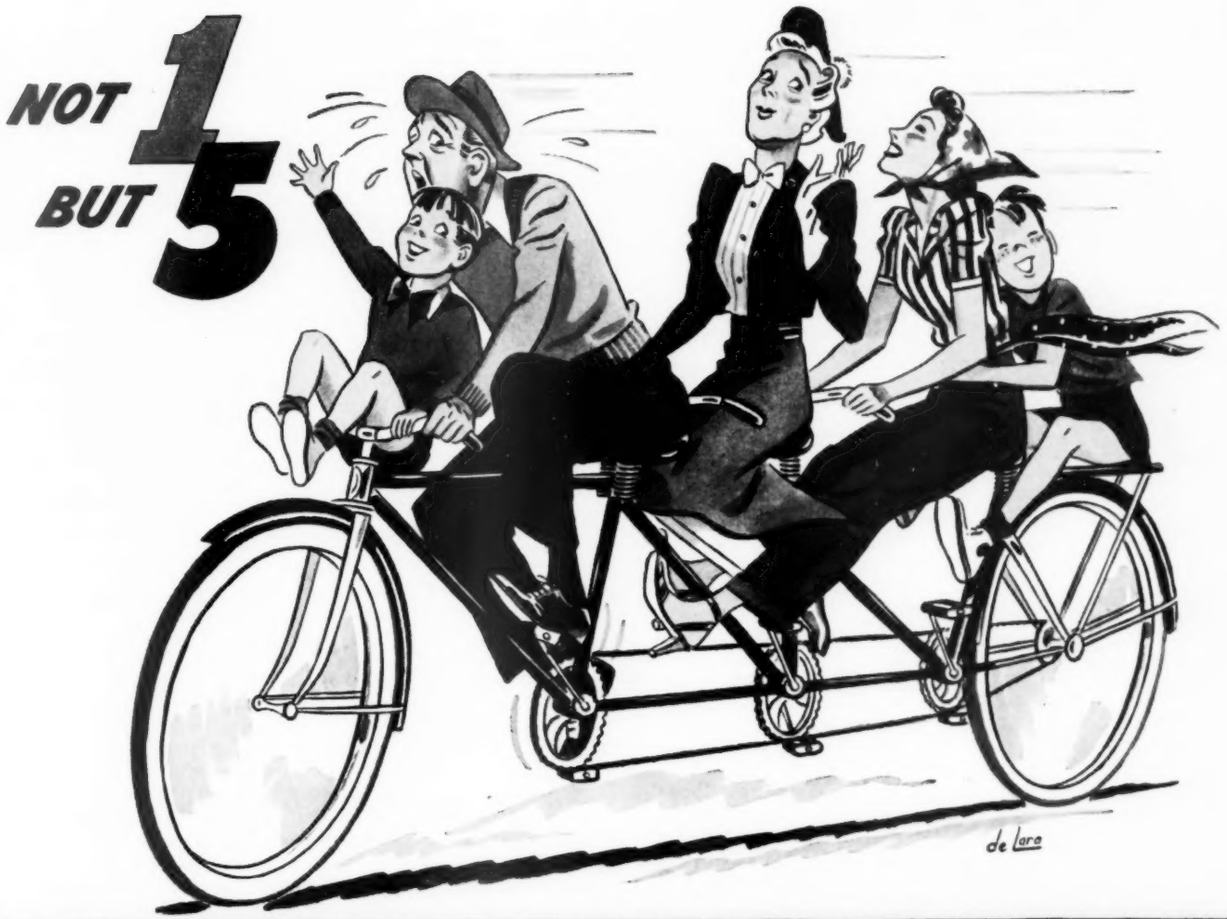
Some engine manufacturers have changed their specifications to use these new bearings however, and according to one report, vehicles built for defense purposes are making no compromises where there is evidence that bearing trouble may be reduced by use of newer types of bearings.

C. M. Gray, St. Louis Public Service Co., speaking at the National Forum on Bus Fuels and Lubricants in Detroit recently, said replacement of copper "hi-lead" bearings with cadmium silver bearings by several manufacturers did not extend bearing life as much as was anticipated and therefore his company had returned to an improved copper lead bearing. He added, however, that these are still subject to corrosion which shortens their life.

Bearing Fit Important

The importance of maintenance was stressed in connection with overcoming bearing and crankshaft wear, particularly by close attention to the details of fitting the bearings. "This means using micrometers and torsion wrenchs, and keeping everything absolutely clean," Gray emphasized. "A small particle of dirt between the bearing shell and the rod or cap will make a high spot on the bearing surface that will cause the bearing to run hot. The bearing shell must not only fit the shaft—it must also fit its support." The St. Louis company has also prolonged bearing life by installing governors which prevent overspeeding of the engines. Great hopes are held for the new centrifugal type governors which so far have been very satsifactory.

Considerable experience with several types of crank-



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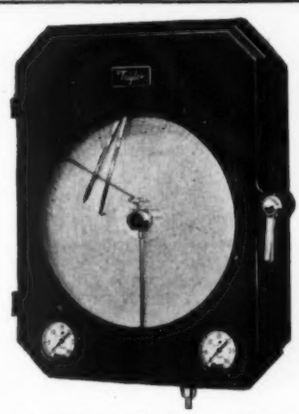

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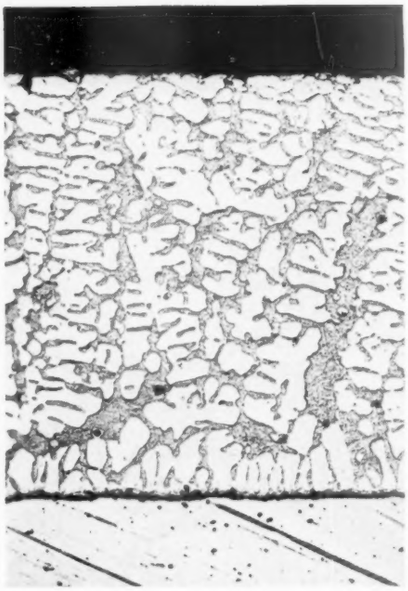
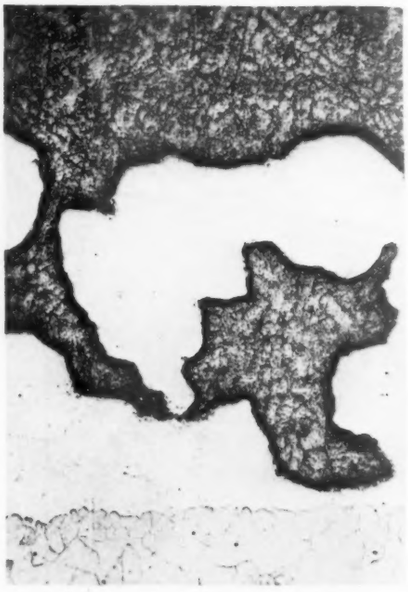
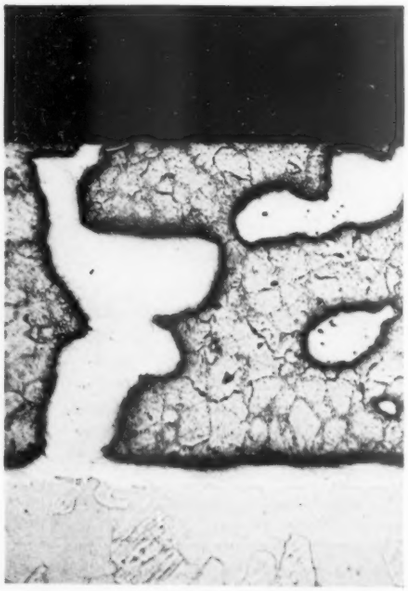


Cross-section of a conventional copper-lead bearing magnified to 100 diameters with steel backing. The white crystals are practically pure lead which makes up 40% of the bearing material. The bearing surface is the edge of the black portion.



A composite bearing composed of copper-nickel hard matrix (white area), bonded by fusion to the steel back. The dark areas are corrosion - resistant lead-base babbitt, bonded into the bearing after bonding the matrix to the steel back. In Buick main bearings the babbitt over-lay is only a few thousandths of an inch thick.



The composite bearing is also made with the overlay of babbitt removed, giving a surface 40% of hard copper - nickel for strength and resistance to fatigue, and a soft surface of babbitt (60%) for anti-friction properties.

case breathers in disposing of acid vapors which dissolve in oil was described which resulted in the adoption of a type providing a one-inch diameter outlet in the valve cover which was covered with a fine screen. This opening is connected to an opening in the inlet side of the carburetor air filter. There was enough draw on crankcase gases to create a ⅝-inch lift on a U-tube water column. These breathers have improved conditions materially, particularly with the new type of high detergent, oxidation-resisting oils which are becoming known as heavy duty oils. Gray's opinion, based on his experience, is that engine designers must give crankcase breathing more consideration with provision to prevent drawing too much oil mist out of the engine.

In addition he said faster oil-cooling and larger oil pumps will also help to correct conditions resulting from oil oxidation and the presence of acid-forming vapors. He has little faith in oil-cleaners in spite of their strong recommendation by manufacturers' representatives and oil companies and said experience in operating buses without cleaners had been as satisfactory, if not more so, than when they were used.

Wants More Oxidation Resistance

A strong agitator for oxidation resistant oils as a cure for bearing corrosion is H. C. Mougey, General Motors Corp., who said at the recent National Forum on Bus Fuels and Lubricants sponsored by the American Transit Association that "the only real solution to the bearing corrosion problem is to prevent oxidation of the oil in the first place." In concluding his address to this group he said the oil industry is doing its part in improving fuels and lubricants but he criticised "some oil companies who have had trouble due to the oxidation of their oils with consequent corrosion of alloy bearings and have blamed their troubles on the alloy bearings." He added that their belief that their troubles would be over if the automobile engineers would only stop using alloy bearings and use babbitt, is not correct. "Corrosion of alloy bearings is only one of the troubles resulting from oxidation of oil," he explained, "and even if the automobile engineers should use bearings that are not subject to corrosion, the oxidation of crankcase oils would still be very undesirable." Mr. Mougey had the "coffee grounds" type of sludge deposits in mind particularly and pointed out the likelihood of their plugging oil lines to cause such troubles as burned out bearings, but said this is only one of the troubles due to oil oxidation.

Mr. Mougey and H. R. Wolf, also of General Motors Corp., stated at two separate technical meetings last November, however, that bearing manufacturers are making considerable progress in the development of corrosion resistant bearings for heavy-duty service. One new bearing which they described is similar in structure to the conventional copper-lead bearing. It has a hard, strong copper-nickel matrix filled with a high lead corrosion resistant babbitt. The magnified cross-sectional appearance of these bearings is illustrated herewith.

These bearings are being used on the Buick car and it was Mougey's conclusion that such bearings will solve the corrosion problem. However, he emphasized that millions of engines with copper-lead or cadmium bearings are now on the roads and these engines will contines to require lubrication for a number of years. Therefore he felt that it is up to the oil industry to produce oils which will not oxidize nor corrode bearings. He then added quickly that "it cannot be emphasized too strongly that the real problem in producing heavy-duty lubricants is in connection with pistons, and not with bearings."

Babbitt Used in Heavy Duty

In support of babbitt bearings, an oil engineer has pointed out that they are being used successfully in heavy duty service where a sufficient flow of oil or other means are provided to prevent excessives temperatures. A Cleveland manufacturer of bearings is supplying two special types of babbitt surface bearings designed to stand up under severe service. One employs a layer of babbitt only 0.01 inch thick on a steel backing and the other is similar but sandwiches a layer of bronze between the babbitt and

the steel backing to provide a certain amount of resilience. The first is said to add about 1.5% additional cost over copper-lead, while the bearing composed of three metals, the best that the company makes, is 50% more expensive.

The advantages of this type of bearing were described by K. K. Karpinski, Chrysler Corp., before a sectional meeting of the Society of Automotive Engineers during the past year.* One of the major advantages of the thin babbitt bearing is that the type of failure which eventually occurs is considerably different than heretofore experienced with the thick bearings, he said.

Failures in thick bearings begin in the form of cracks at the surface, which then work through the lining. When a number of such cracks appear they usually surround a fairly large area. Hydraulic action of the oil enters these cracks and causes eventual disintegration of such areas, leaving large craters behind. As a result the oil film characteristics are interrupted causing a rapid rise in temperature. Failures in the new thin babbitt bearings are about the size of a common pin head. Even though a number of such small failures may be observed in a bearing, the oil film characteristics are not disturbed, he said. In road tests where failure would be expected at 20,000 miles in motor car operation, the new bearings still were in excellent serviceable condition after 40,000 miles of service, he concluded.

The failure of a bearing with only a steel backing is felt by users to be a greater risk than when a bronze backing is provided because a vehicle can "limp" in to a garage on bronze whereas it might be stranded 50 miles from a point of service in case of failure with only the steel backing. The manufacturer points out, however, that there is still a possibility of there being a film of babbitt on the steel backing after failure which would permit a truck or bus to "limp" to a point where repairs could be made.

Combustion Products a Cause

One oil company engineer believes that the present corrosion problem can be traced to products of combustion of motor fuel rather than to any characteristic of motor oil. All gasolines contain a certain amount of sulfur or sulfur compounds which, during the combustion process, are converted at least partially to sulfur dioxide gas. Corrosion from this sulfur would have no relation to lubricating oil oxidation. The possibility of this type of corrosion is the basis for the use of crankcase ventilation sufficient to remove the offending vapors before they condense and settle in the crankcase oil.

Gasoline is not the only possible source of sulfur for producing these corrosive acids. One severe case of bearing corrosion, described at the A. T. A. meeting, was traced to a cheap filter cartridge. It was found that a sulfur-containing cement was used in these cartridges and that this corrosive sulfur was dissolved in the hot oil passing through the filter and was carried to the bearings on which it reacted.

In discussing the epidemic of copper lead bearing failures at the A. T. A. meeting, C. J. Livingstone, Gulf Research & Development Co., expanded on this phase of the corrosion problem. He pointed out that "the trouble has in many cases been associated with low temperature operations. In some instances which have come to our attention the crankcase oil has even been diluted. When an engine is run cold enough to produce dilution in the crakcase oil, we may be sure that corrosion of the bearings is not due to lubricating oil oxidation. The two just do not occur together. Also, in some of the engines where the copper lead bearings have been corroded, cadmium silver bearings in the same engine have been unaffected. It is our experience that cadmium silver is just as susceptible to corrosion by lubricating oil acids as copper lead. When the copper lead bearings corrode and the cadmium silver bearings do not, there is every reason to believe that the copper lead bearings have other inherent weaknesses besides their susceptibility to corrosion by lubricating oil acids.

"While concentrated sulfuric acid may be stored in iron containers, dilute sulfuric acid will attack the iron," Mr. Livingstone explained. "Dilute sulfurous or sulfuric acids may be present in cold running engines that are not sufficiently ventilated. Lead, on the other hand, is not subject to attack by weak sulfuric acid even though it is susceptible to corrosion by weak organic acids and is somewhat soluble in distilled water."

*NATIONAL PETROLEUM NEWS, Aug. 7, 1940, p. R-296.

Failure After Replacement

A large number of the failures which came to the attention of Gulf laboratories occurred with replacement bearings in engines which had been run satisfactorily for 100,000 miles or more on the identical lubricating oil and fuel used when the trouble occurred. Mr. Livingstone said when the bearings were replaced, the trouble showed up after about 10,000 to 15,000 miles on the new bearings. Such failures have occurred with oils guaranteed to eliminate bearing corrosion as well as with average high quality oil and no difference could be detected in the type of corrosion. Although failures of this type have been blamed on tetraethyl lead by some, Gulf laboratories have been unable to find any connection between the lead in the gasoline and copper-lead bearing failures.

"Others have blamed the trouble on the sulfur in the fuel which, by the way, is present in all gasolines," he added. "We have added a cracked fraction of high sulfur content of the lubricating oil, and have by so doing retarded bearing corrosion in engines where corrosion by oil acids was present. A chemical analysis of the corroded surface of some copper-lead bearings has shown the presence of a spongy copper sulfide deposit. All our experimental evidence, however, indicates that the sulfur would attack the copper only after the lead has been removed from the bearing either mechanically or by previous corrosion by lubricating oil acids.

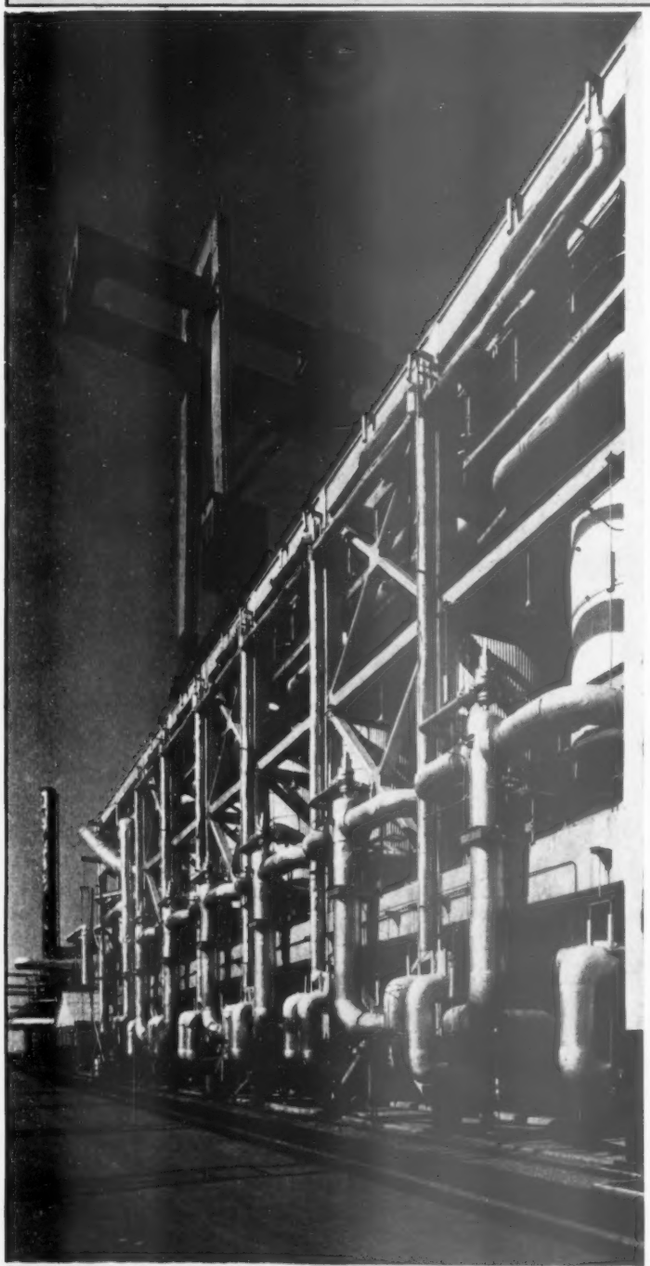
"A copper-lead bearing in normal service will show some lead sweated from the surface of the bearing, additional lead coming to the surface only when the temperature of the bearing is increased by the partial failure of the lubricating oil film. In a bearing operated in a lubricating test machine at 4000 rpm. at loads of 500, 1000, 1250 psi. for 5 hours each with an inlet oil temperature of 225°F., a considerable amount of lead was sweated out of the bearing. . . . The action of sulfur on this crushed copper sponge will probably result in the formation of a copper sulfide which would penetrate below the surface of the bearing. Where lead removal occurs in spots on the bearing surface, the subsequent formation of copper sulfide in these areas would explain the pock-marked surface that is sometimes seen in bearings which have failed in low temperature operations.

Lead Sweating Possible

"Where sufficient bearing clearance is not allowed when bearings are replaced, there is no doubt that lead sweating will occur. Since most engines show some block distortion as well as distortion of the big end of the connecting rod after 100,000 miles or so of operation, it is customary in some shops to line-bore the main bearings and to true up the rod bearings after the shells have been assembled. Unless this is done it is almost impossible to obtain bearings which will not bind on the shaft. We do not believe that copper-lead bearings which are finished by a broaching operation by the manufacturer are improved by these machining operations which are necessary in the operator's shops. . . . Profilograph measurements show an increase of from 7 to 200 micro-inches in surface roughness (when bored with the fly cutter). Since copper-lead bearings have no conformability such as babbitt, it is our belief that some of the copper-lead bearing failures can be traced to the fitting of copper-lead bearings by mechanics with babbitt experience.

"It is very seldom that some out-of-roundness of the journal is not found at the overhaul period in engines which have been run on copper-lead bearings. In order to take care of the out-of-roundness of the journal, the bearing clearance should even be increased above that set in the manufacturer's specifications." Mr. Livingstone concluded, therefore, that copper-lead has not proved to be a satisfactory bearing for replacement. "If line-boring is to be practiced, it should be pointed out that the indium treated bearing will not be much better than the conventional copper-lead bearing in that the indium protection would be largely

New Equipment FOR New Processes



SUN Shipbuilding and Dry Dock Co. have gained unique experience in the fabrication of unusual and complicated equipment during the development of the Houdry Catalytic Cracking Process.

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removed by such a practice." Catalytic effect of the metals is also reactivated so that the engine must go through another break-in period.

It has also been noted by Gulf engineers that when dirt becomes embedded in the surface of a copper-lead bearing, corrosion may be induced at that point. Localized heating due to the dirt particles rubbing on the shaft, as well as weakening of the surface by crushing the copper-lead structure may eventually lead to bearing failure if enough of the bearing area is affected.

Some improvements have been noted in failures from fatigue but it is believed that more failures from other causes, such as have been discussed here, are occurring in the field than fatigue failures have been eliminated. Lowering the temperature of the crankcase oil through the use of oil coolers and, consequently, the bearing temperatures, will help to minimize fatigue failures, Mr. Livingstone said.

"Fortunately," he concluded, "better solutions for fatigue troubles at high temperatures than either cadmium silver or copper lead have recently made their appearance. The Tri-metal and the Durex bearings show great possibilities in this direction."

Oil Coolers Extend Bearing Life

The successful use of oil coolers in commercial vehicle service was outlined briefly in NATIONAL PETROLEUM NEWS, March 19, 1941, p. R-92, from the experience of Federal-Mogul Co. in extensive tests as told by R. A. Watson a year ago at a California section meeting of the Society of Automotive Engineers. A radiator type or "tractor-type" oil cooler is mounted in front of the cooling-water radiator. Several cooling devices were tried out but this was found the most practical. By maintaining an oil temperature of 180°F., a much longer bearing life was obtained. The reduction in temperature obtained by increased oil flow was said to be small as compared to that obtainable by a positive cooler because the mere speeding up of oil flow does not lower bearing temperature unless the oil itself is cooler than the bearing. Mr. Watson concluded that corrosion of cadmium-silver and copper-lead is not likely if temperature is maintained at 180°F. and a proper lubricating oil is used.

On the bearing maker's side of the picture, it is believed that whereas there appear to be a few exceptional lubricating oils which eliminate what has been termed "cold corrosion" when substituted for other high quality oils in the same service, there is no assurance that the bearings on all engines put out by any manufacturer will be lubricated by this particular oil and no desire on the part of manufacturers to specify a certain few oils. Therefore, the trend appears to one observer to be away from the copper-lead bearing to bearings which will stand the severe service without danger of corrosion.

W. A. Taussig, Burlington Transportation Co., also touched upon lubrication problems in connection with problems in bus operation using 2-cycle diesels. Among improvements in design made on these engines as a result of these trials was ventilating the crankcase to atmosphere and doubling the capacity of the absorption type oil filter. One of his conclusions was that any oil that breaks down in service into corrosive compounds must be treated with neutralizing corrosion inhibitors to protect copper-lead engine bearings.

Bearing Metals Studied

As a part of the Federal-Mogul Corp. investigation of oil cooling in relation to bearing life, the properties and behavior of bearing metals were studied to find out how temperature and load affect their life, and why. It was determined, according to R. A. Watson, that the life of a bearing in an engine is dependent upon the following properties of the bearing material: Fatigue strength, ability to resist seizure of the steel shaft during periods when there is metal-to-metal contact, good bonding characteristics, mechanical compressive strength, conformability, embeddability, and corrosion resistance.

They concluded that fatigue strength usually is the most important property of a bearing material as it determines the allowable load and life in the majority of cases. They agreed with others that alterations of load will cause fatigue cracks which may surround and undermine areas. Loss of sufficient area so greatly reduces the load-carrying ability that failure occurs. In field tests it was determined that fatigue resistance of the bearing metal is dependent upon the ratio of the tensile strength to the stress to which the metal is subjected. The tensile strength was shown to depend on bearing temperature. Therefore, it was finally concluded that bearing life is dependent upon the temperature of the bearing metal.

This appears to be in general agreement with other investigations although some other engineers are less inclined to provide the necessary means for reducing excessive temperature, thus attempting to push the oil industry into producing oils of higher temperature resistance rather than providing cooling means at a cost to themselves. However, as is apparent from further experience reported herewith, high-temperature corrosion is not the only kind of corrosion and not until it was eliminated was it determined that there is a corrosion problem even at the relatively low temperatures when copper-lead bearings are used.

Corrosion of Aircraft Bearings

Further evidence of what can be done with bearings to eliminate corrosion is the reported fact that the airplane industry is using copper-lead bearings without corrosion under severe operating conditions but is doing it with a higher quality bearing than is being put into commercial vehicles. Airplane bearing corrosion trouble was experienced a few years ago, but was eliminated by providing a tighter fitting bearing which makes a better heat path for dissipation of heat and by removing, after installation, ripples or any irregularities or humps in the bearing surface where heat might be generated. It was found after this was done, according to one authority, that if two bearings of the same material were installed, one by the old and one by the improved method, the first would corrode and the other would stay in good condition. This authority, an oil company lubrication engineer, therefore feels that the problem is simply one for the engine manufacturers to decide, whether to install a cheap bearing or one of higher quality which will resist corrosion. As for the vehicles which already have the inferior bearing installation, it is felt that when they fail they must be replaced by higher quality bearings.

It is readily admitted that conditions in an airplane engine may be different than in a bus or truck. One difference is that the airplane engine under discussion blew all of the combustion products, including those which might be corrosive, out the exhaust before they had a chance to contaminate the oil. There is also said to be appreciable oil consumption in the airplane engine which designers try to avoid in commercial vehicles. While crankcase ventilation has been proposed as a possible cure, it has been found that this can be carried too far and increase oxidation and oil consumption. Another engineer pointed out that airplane operation is continuous, thus contrasting with the intermittent operation of buses and giving no opportunity for low temperatures. Also provision is made for cooling the oil in airplane operation in heavy-duty service, he said.

Standard for Water Analysis

A new tentative method of reporting results of analysis of industrial waters, D 596-40T, is announced by the American Society for Testing Materials. Committee D-19 is anxious for the method to come quickly into extensive use. The necessity for improvements in accuracy, convenience and standardization in reporting the results of water analysis was discussed by R. C. Adams, U. S. Naval Engineering Experiment Station at the recent annual meeting of the A. S. T. M. He said this method meets the requirements of understandability, familiarity, convenience, and precision necessary to make it generally acceptable and usable. Single copies are available from A. S. T. M. Headquarters, 260 S. Broad St., Philadelphia, at 25c.

Co-operative Research Needed for Combustion

THE only hope of maintaining the rate of progress of the past 3 or 4 decades in combustion research lies in a carefully planned and comprehensive program of study, executed on a national scale, yet having a flexibility that is adequate to provide for immediate attacks upon new and promising issues when these become apparent, Ernest F. Fiock, National Bureau of Standards, said at the National Aeronautic meeting of the Society of Automotive Engineers meeting recently in Washington. This statement was made in a paper in which he told what has been accomplished, what is being done, and what future trends are apparent.

Mr. Fiock said this conclusion comes after nearly 10 years of association with combustion research during which the impression grew that "little short of a complete understanding of the whole process of ignition and combustion in explosive mixtures of gases will prove adequate to answer the highly practical questions that might, with reason, be asked by the engineer seeking to improve the design and construction of an internal combustion engine. Such a picture can be evolved only by the protracted and co-operative efforts of interested groups, and active participation of new and larger groups is now highly desirable.

"Although there has been a steady accumulation of a large number of experimental facts, no mind capable of fitting these together to form a comprehensive whole has yet appeared, or, as seems more probable, some important factors have so far been overlooked entirely."

Since the indicator diagram is the recognized criterion for evaluating the power and efficiency of the explosion and it reflects also the degree of detonation and explosion shock, it was considered logical to decide first what improvements are possible in the indicator card, and then seek means of obtaining these characteristics through combustion control.

Application of the simple principles involved in the theory of the internal-combustion engine to the improvement of engines was said to require that higher compression ratios be made practical, that more powerful or efficient mixtures be developed, and that better control of the rate of rise in pressure during combustion be achieved. One of the immediate problems of combustior control is to find means to suppress detonation and preignition in spark-ignition engines at higher and higher compression ratios.

Mr. Fiock divided his discussion into four parts corresponding to four ways for improvement. These are as follows:

1. "By finding new mixtures which are inherently more powerful or more economical.

2. "By finding new methods of altering the mass rate of burning, the completeness of combustion, and hence also the rate of increase in pressure.

3. "By preventing preignition in spark-ignition engines and facilitating ignition in compression-ignition engines.

4. "By suppressing detonation."

New Mixtures Possible

New and improved mixtures were seen as possible through the discovery of either new fuels or new additives. If a new fuel is to be superior to those commonly available, it must have a higher heating value, or it must burn to give a greater number of product molecules, or it must burn more completely, leaving less combustible material such as CO in the exhaust gas, or it must permit the use of higher compression ratios without detonating. Although the present emphasis seems to be on higher octane number, some of the other possibilities may also be realized eventually, he said.

One highly practical aspect of the more general aim of combustion research is to discover the molecular mechanism of the burning process so that other substances cheaper or more effective than tetraethyl lead in suppressing detonation might be discovered. There are many other ways by which factors related to mixture composition might be controlled in the interest of greater power output or better economy of a given engine, Mr. Fiock added and not a great deal of research effort seems to have been expended upon them so far.

The feasibility of introducing additional oxygen into the cylinder, the possibility of determining causes of difference between fuel-oxygen ratios for maximum power and maximum economy, and of finding materials which will prevent or reduce radiation losses were questions raised for answer in the future. In connection with radiation, it was pointed out that some studies of the emission spectra of flames and of the absorption spectra of the unburned gas within the engine cylinder have already been made in General Motors laboratories and Bureau of Standards. Through photographs of the spectra, certain intermediate products of the oxidation of the hydrocarbon fuels have been positively identified. Although it does not seem that any of the intermediates identified so far are of controlling importance in the burning process, spectroscopic examination of engine flames is still felt to be a promising field for future study.

Sufficient thermodynamic data are now available to permit the compilation of charts, similar in general nature and purpose to the Mollier diagram for steam, but applicable to explosions in the engine cylinder. The accuracy and usefulness of such charts will both improve, it is believed. Recently an attempt to correlate observed flame volume with observed pressures through use of such charts was made by General Motors, it was pointed out.

Flame Speed Needs Control

If the rate of development of pressure is to be controlled, it must be done by changing flame area or flame speed. This was said to be subject to some control by changing the contour of the combustion chamber. The movements occurring throughout the unburned charge also influence flame area and the speed with which a flame moves in the combustion chamber has been found to increase with engine speed. Through a group of independent observations, Fiock said he had been led not only to believe in the existence of local turbulence in the engine, but also to suspect that, by rendering the flame front irregular, it does a real service by increasing the mass rate of burning. If it can be discovered how local turbulence is induced, he added, perhaps a method can be found for intensifying it. If this can be done, a desirable effect upon power and efficiency will result, and it seems highly probable that the more rapid burning would decrease the tendency to knock, since less time would be available for preflame reactions.

Considerable significance was attached to measurement of the transformation velocity although it has not seemed feasible yet to measure this in an engine cylinder. Measurement in a bomb has shown that the addition of tetraethyl lead is without effect upon this property during the normal burning, and that there is no relation between transformation velocity under the conditions of

the experiments, and the tendency to knock. Results obtained with the spherical bomb also indicate that the rise in pressure for a given mass of charge inflamed is less than would be expected from calculations based on thermal data and the assumption that reaction goes to chemical equilibrium in a very thin flame front.

The presence of a so-called "afterburning" may be important in the course of future combustion research. It now complicates any theoretical treatment as well as the compilation of thermodynamic charts. Fiock pointed out further that Rothrock and Spencer have suggested "that, in some cases, knock may occur in the burned gas as a result of sudden liberation of energy remaining after the initial passage of flame." Obviously the efficiency of the combustion process can be improved and the probability of this kind of knock can be decreased, if a method of promoting more complete reaction in the flame front can be evolved, he said. A solution of this problem seems entirely within the bounds of possibility, and experimental work in this line might pay big dividends.

Preignition of Growing Importance

The control of preignition was said to be a field of growing importance and one in which research is only well begun. Preignition and detonation are distinct phenomena, he pointed out, but are not always recognized as such. No satisfactory method is yet available for determining the relative tendencies of fuels to preignite in engines. The need for such a scale becomes greater as new fuels are being prepared.

Mr. Fiock described the more familiar phenomenon of detonation or fuel knock as characterized by an abnormally high rate of inflammation of the last portion of the charge to burn, accompanied by excessive local pressures and rates of pressure rise, high heat losses, objectionable noise in the automobile engine, and stresses which may be destructive to the aircraft engine. Although its effects are well known, the real nature of fuel knock is not yet understood. The increased loss by radiation, together with the mechanical loss involved in imparting vibration to the solid parts of the engine, accounts for the increased heat loss which has long been recognized as one of the undesirable results of detonation. It is hoped that a part of the missing information can be obtained by giving more careful attention, not to normal burning and not to detonation individually, but to the obscure and neglected transition from the former type of burning to the latter. It is in this transition stage that differences in the behavior of fuels should become apparent, and some of the vital factors governing detonation should be most readily discovered. To this end, apparatus involving an untried method of study is currently being constructed at the Bureau of Standards with the support of the National Advisory Committee.

Mr. Fiock did not describe this apparatus but said it is designed to determine the effects of various factors such as pressure, temperature and time upon the reactions which take place homogeneously throughout mixtures of hydrocarbons and air, at conditions approximating those prevailing in the end gas of an engine. These experiments may or may not support previous evidence that preflame reactions are responsible for the start of detonation, and they may show the way to a new method of determining the relative tendencies of fuels to knock.

Western Metal Congress

New metals for the petroleum industry, new processes of welding, non-corrosive alloys for the pipeline and refinery, and numerous other metallurgical innovations will be discussed at the coming Western Metal Congress, May 19-23 in Los Angeles. Now scheduled on the Pacific Coast for the fourth time, the American Society for Metals and numerous other technical groups, including western branches of the American Petroleum Institute, are cooperating. Attendance is predicted at 50,000 by W. H. Eisenman, secretary.

Bearing metals, which are now of particular concern in the field of commercial vehicles, will be discussed in relation to their physical metallurgy by Dr. O. E. Harder, president of the American Society for Metals and assistant director, Battelle Memorial Institute.

"How Metals Behave at High Temperature", a paper said to be of great interest to the oil industry, will be presented by Bradley Stoughton, Lehigh University. "Design of Metals" will be discussed by H. W. McQuaid, Republic Steel Corp., and E. E. Thum, editor of Metal Progress, will give four lectures on "The Inspection of Metals."

Exhibitors will occupy more space than any western metal exposition of the past.

Design Beats Special Fuel In Starting Diesel Engine

Far greater improvements in starting diesel engines nave been obtained by design changes than by any method of treating the fuel, it is concluded by L. A. Blanc, Caterpillar Tractor Co., following an attempt to develop a special diesel fuel for easy starting purposes.* However, designs providing great improvement in starting often have harmful effects on performance, he found.

Although the results of experiments with fuel dopes seemed very promising, the element of danger involved in a wide distribution of any heavily doped or highly volatile fuel was considered important. As the practical aim of the work was to see what could be done to utilize inexpensive starting equipment, further work was done on the injection system.

"It was found that the maintenance of high residual pressures in the fuel line were of material aid in starting. The use of a light spring for loading the check valve on the fuel pump achieved this purpose and seemed also to stabilize the speed when the engine was operating at 1800 rpm. near maximum load. Any increase in the diameter of the fuel line seemed to cause skipping at some speeds. For the injection valve, the ability to maintain a low-frequency flutter of the needle and to break up the spray, e. g., by counterboring the end plate, seemed to be requisites for improved starting and performance.

*Diesel Power, March, 1941.

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New Patents

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, NW, Washington, D. C., from whom copies may be obtained at rate of 25c each. State number of patent and name of inventor when ordering.

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Synthesis of unsaturated petroleum hydrocarbon oils—H. B. Kipper, Accord, Mass. Filed May 29, 1939. No. 2,228,356.

Solvent extraction process—B. C. Belden, assignor to Standard Oil Development Co. Filed June 4, 1938. No. 2,228,434.

Apparatus for distilling oil shale—E. P. Morrish, St. Louis. Filed Jan. 19, 1938. No. 2,228,474.

Solvent refining of hydrocarbon oil—L. W. Cook, assignor to Texas Co. Filed June 18, 1937. No. 2,228,507.

Conversion of hydrocarbon oils—R. J. Dearborn, and L. G. Story, assignors to Texas Co. Filed June 1, 1939. No. 2,228,510.

Recovery of oil from spent metal halide catalyst masses—R. H. M. Meyer, Netherlands, assignor to Shell Development Co. Filed Aug. 25, 1939. No. 2,228,527.

Process of converting hydrocarbons—M. P. Youker, assignor to Phillips Petroleum Co. Filed Nov. 25, 1935. No. 2,228,620.

Polymerization of olefins—S. H. McAllister, assignor to Shell Development Co. Filed Nov. 25, 1938. No. 2,228,669.

Treatment of hydrocarbons—L. N. Leum, and E. R. Birkhimer, assignors to Atlantic Refining Co. Filed Mar. 11, 1940. No. 2,228,724.

Purification of hydrocarbons—F. J. Soday, assignor to United Gas Improvement Co. Filed May 27. May 28, June 7, and June 14, 1938. Nos. 2,228,788, 2,228,789, 2,228,790, and 2,228,791.

Apparatus for producing high octane rating motor fuel—P. A. Maschwitz, assignor to Pure Oil Co. Filed June 28, 1935. No. 2,228,882.

Extreme pressure lubricant—H. G. Berger and D. E. Badertscher, and F. M. Sager, assignors to Socony-Vacuum Oil Co. Filed Dec. 3, 1937. No. 2,228,252.

Lubricant—J. F. Olin, and R. H. Goshorn, assignors to Sharples Solvents Corp. Filed July 27, 1937. No. 2,228,325.

Process for making lubricating oils—R. F. Bergstrom, assignor to Shell Development Co. Filed Apr. 27, 1940. No. 2,228,500.

Compounded mineral oil—B. B. Farrington and J. O. Clayton, assignors to Standard Oil Co. (Cal.) Filed Nov. 21, 1938. No. 2,228,658.

Compounded mineral oil—B. B. Farrington, J. O. Clayton, and J. T. Rutherford, assignors to Standard Oil Co. (Cal.) Filed Nov. 21, 1938. No. 2,228,659.

Compounded oil—E. W. Gardiner and G. H. Denison, Jr., assignors to Standard Oil Co. (Cal.) Filed Oct. 8, 1938. No. 2,228,661.

Motor fuel—M. M. Holm, assignor to Standard Oil Co. (Cal.) Filed May 31, 1939. No. 2,228,662.

Compounded mineral oil—G. L. Neely and E. W. Gardiner, assignors to Standard Oil Co. (Cal.) Filed Nov. 25, 1938. No. 2,228,671.

* * *

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Hydrocarbon oil treatment—W. F. Houghton, assignor to Atlantic Refining Co. Filed Aug. 19, 1938. No. 2,229,209.

Apparatus for heating petroleum—A. E. Nash, and F. E. Shelly, assignors to Alcorn Combustion Co. Filed Oct. 3, 1938. No. 2,229,253.

Method of treating hydrocarbons—W. A. Craig, assignor to Richfield Oil Corp. Filed June 28, 1938. No. 2,229,278.

Conversion of hydrocarbon oils—C. L. Thomas and J. E. Ahlberg, assignors to Universal Oil Products Co. Filed Nov. 26, 1937. No. 2,229,353.

Method and apparatus for distillation of oil—J. L. Cooley, L. P. Elliott, and H. B. Nichols, assignors to Standard Oil Co. (Calif.) Filed Mar. 22, 1938. No. 2,229,623.

Driving journal compounds—E. W. Adams, and L. C. Brunstrum, assignors to Standard Oil Co. (Ind.) Filed Sept. 29, 1938. Nos. 2,229,030, 2,229,041, and 2,229,042.

Catalyst and process for its production—Alexis Voohies, Jr., assignor to Standard Oil Development Co. Filed Dec. 17, 1935. No. 2,229,199.

Grease and method for preparing same—L. C. Brunstrum, and R. A. Swenson, assignors to Standard Oil Co. (Ind.) Filed Apr. 29, 1940. No. 2,229,368.

Method of increasing sludge stability of petroleum lubricating oil distillate—W. H. Bahlke and T. H. Rogers, assignors to Standard Oil Co. (Ind.) Filed Nov. 30, 1939. No. 2,229,485.

Stabilized hydrocarbon oil—B. H. Shoemaker, assignor to Standard Oil Co. (Ind.) Filed Mar. 23, 1938. No. 2,229,528.

* * *

January 28, 1941

Process for separating wax from oil—V. N. Jenkins, assignor to Union Oil Co. (Cal.) Filed Oct 18, 1937. No. 2,229,658.

Process for separating wax from oil—D. E. Carr, assignor to Union Oil Co. (Cal.) Filed Oct. 18. 1937. No. 2,229,659.

Low temperature polymerization of iso-olefins—M. D. Mann, Jr., assignor to Standard Oil Development Co. Filed Aug. 12, 1933. No. 2,229,661.

Process for production of valuable products from cracked petroleum distillates—F. R. Moser, assignor to Shell Development Co. Filed Dec. 27, 1938. No. 2,230,005.

Wax sweating process and apparatus—M. E. Hanson and R. M. Owens, assignors to B. F. Sturtevant Co. Filed May 23, 1939. No. 2,230,079.

Process for removing acid components from hydrocarbon distillates—D. L. Yabroff, and E. R. White, assignors to Shell Development Co. Filed May 5. 1939. No. 2,229,995.

Lubricant manufacture—E. B. McConnell, assignor to Standard Oil Co. (Ohio) Filed Oct. 22, 1938. No. 2,229,858.

Mineral oil—M. S. Altamura, H. G. Berger, and D. E. Badertscher, assignors to Socony-Vacuum Oil Co. Filed Oct. 26, 1939. No. 2,230,022.

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Production of hydrocarbons—J. S. Carey, assignor to M. W. Kellogg Co. Filed Feb. 11, 1937. No. 2,230,219.

Separation of liquids; method for distillation of liquids, and method and apparatus for producing intimate contact between fluids—Jean Loumiet et Lavigne, Itabo, Cuba. Filed Feb. 18, Apr. 12, and July 12, 1938. Nos. 2,230,253, 2,230,254, and 2,230,255.

Purification of hydrocarbons—F. J. Soday, assignor to United Gas Improvement Co. Filed May 26, 1938. No. 2,230,274.

Conversion of hydrocarbons—Vasili Komarewsky, assignor to Universal Oil Products. Filed Feb. 25, 1938. No. 2,230,461.

Catalytic cracking and cracking catalysts—R. F. Marschner, assignor to Standard Oil Co. (Ind.) Filed Dec. 30, 1937. No. 2,230,464.

Combined regenerating and catalyst chamber—H. M. Nelly, Jr., and H. C. Hottel, assignors to M. W. Kellogg Co. Filed Jan. 27, 1938. No. 2,230,467.

Production of gasoline—Alexis Voorhies, Jr., assignor to Standard Oil Development Co. Filed May 31, 1939. No. 2,230,552.

Conversion of hydrocarbons—E. T. Layng, assignor to Polymerization Process Corp. Filed June 1, 1939. Nos. 2,230,648 and 2,230,978.

Conversion of hydrocarbons—R. F. Ruthruff, assignor to Polymerization Process Corp. Filed June 1, 1939. Nos. 2,230,979 and 2,230,980.

Preparing improved oxidation inhibitors and products thereof—R. N. Meinert, and J. M. Whiteley, Jr., assignors to Standard Oil Development Co. Filed Nov. 27, 1937. No. 2,230,542.

Lubricant with high temperature stability—L. A. Mikeska, and J. F. Nelson, assignors to Standard Oil Development Co. Filed Dec. 30, 1938. No. 2,230,543.

Mineral concentration process—P. J. Gaylor, assignor to Standard Oil Development Co. Filed Sept. 1, 1938. No. 2,230,565.

Apparatus for analyzing gaseous mixtures—G. L. Hassler, assignor to Shell Development Co. Filed Oct. 31, 1938. No. 2,230,593.

Process for separating gas and oil—D. L. Katz, assignor to Phillips Petroleum Co. Filed Mar. 18, 1935. No. 2,230,619.

Fuel oil—H. G. M. Fischer and S. H. Hulse, assignors to Standard Oil Development Co. Filed Aug. 13, 1938. No. 2,230,642.

Lubricant and lubrication therewith—A. W. Lewis, assignor to Tide Water Associated Oil Co. Filed Mar. 11, 1937. No. 2,230,691.

Diesel fuel—B. H. Shoemaker, assignor to Standard Oil Co. (Ind.) Filed Dec. 21, 1936. No. 2,230,817.

High octane number motor fuel—Pharis Miller, and A. Y. Mottlau, assignors to Standard Oil Development Co. Filed Nov. 25, 1938. No. 2,230,844.

Stabilized high boiling petroleum fractions—E. E. Reid, and L. A. Hamilton, assignors to Socony-Vacuum Oil Co. Filed Dec. 29, 1939. No. 2,230,966.

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Solvent treating of mineral oils—C. J. Wilson, assignor to Standard Oil Development Co. Filed July 30, 1938. No. 2,231,147.

Process and apparatus for catalytic operations—Philip Subkow, assignor to Union Oil Co. (Cal.) Filed Aug. 9, 1937. No. 2,231,231.

Amplified distillation—J. R. Bailey, assignor to Union Oil Co. (Cal.) Filed Apr. 8, 1935. No. 2,231,241.

Separation of low boiling components from a wide boiling range mixture—C. G. Gerhold, assignor to Universal Oil Products Co. Filed Sept. 30, 1938. No. 2,231,444.

Treatment of hydrocarbons—A. V. Grosse, assignor to Universal Oil Products Co. Filed Apr. 14, 1937. No. 2,231,448.

Treatment of paraffin hydrocarbons—J. C. Morrell, assignor to Universal Oil Products Co. Filed Oct. 16, 1939. No. 2,231,452.

Process of treating hydrocarbon oils—H. E. Drennan, assignor to Phillips Petroleum Co. Filed July 25, 1936. No. 2,231,803.

Apparatus for fractional distillation—S. L. Kerr, assignor to United Gas Improvement Co. Filed Aug. 20, 1938. No. 2,231,828.

Catalytic condensation of hydrocarbons—R. D. Pinkerton, assignor to Sinclair Refining Co. Filed Aug. 20, 1938. No. 2,231,831.

Lubricant—D. R. Merrill, assignor to Union Oil Co. (Cal.) Filed May 3, 1938. No. 2,231,022.

Lubricant—J. H. Bartlett, assignor to Standard Oil Development Co. Filed Oct. 14, 1938. No. 2,231,148.

Stabilized lubricant—E. W. Cook, assignor to Tide Water Associated Oil Co. Filed Sept. 7, 1939. No. 2,231,157.

Steam cylinder oils and processes of preparing same—Arthur Lazar, and J. V. Crenna, assignors to Tide Water Associated Oil Co. Filed June 11, 1937. Nos. 2,231,167, 2,231,168, and 2,231,169.

Soluble oil—R. F. Nelson and T. W. Langer, assignors to Texas Co. Filed May 6, 1938. No. 2,231,214.

Lubricant—F. P. Bowdell, Cambridge, England. Filed Nov. 2, 1937. No. 2,231,248.

Lubricating composition—H. G. Smith, assignor to Gulf Oil Corp. Filed Nov. 1, 1939. No. 2,231,301.

Gum inhibitor—A. F. S. Musante and J. H. Perrine, assignors to Sun Oil Co. Filed Aug. 22, 1939. No. 2,231,344.

Transportation of oil and gas vapors in a pipe line—F. J. Harlow, assignor to Phillips Petroleum Co. Filed June 26, 1939. No. 2,231,500.

Liquid fuel—A. L. Stillman, assignor to Fuel Research Corp. Filed Nov. 5, 1938. No. 2,231,513.

Method of breaking foam—W. E. McCorquodale, Jr. and C. H. Brooks, assignors to Sun Oil Co. Filed June 16, 1938. No. 2,231,544.

Process of obtaining fuel oil from digested sludge—Saburo Shibata, Japan. Filed Sept. 26, 1938. No. 2,231,597.

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Treatment of cracked petroleum residue—R. E. Burk, assignor to Standard Oil Co. (Ohio) Filed Aug. 31, 1938. No. 2,232,435.

Purification of light mineral oil distillates—R. E. Burk and E. C. Hughes, assignors to Standard Oil Co. (Ohio) Filed Aug. 31, 1938. No. 2,232,436.

Solvent dewaxing—H. H. Hardin, assignor to Socony-Vacuum Oil Co. Filed June 9. 1939. No. 2,232,603.

Production of high quality benzine and diesel motor fuels—T. W. Pfirrmann, Germany. Filed Aug. 23, 1938. No. 2,232,673.

Lubricant—A. R. Workman, assignor to Cities Service Oil Co. Filed Sept. 21, 1939. No. 2,232,421.

Catalyst carrier forming machine—G. A. Frenkel, assignor to Shell Development Co. Filed Oct. 15, 1940. No. 2,232,444.

Hydraulic fluid—J. C. Woodhouse and A. G. Weber, assignors to E. I. du Pont de Nemours & Co. Filed July 15, 1939. No. 2,232,581.

Lubricant—Laszlo Auer, assignor to Gulf Oil Corp. Filed Apr. 21, 1930. No. 2,232,649.

Method for carrying out chemical reactions—F. M. Pyzel, assignor to Shell Development Co. Filed May 27, 1939. No. 2,232,674.